

THE A·B·C OF NATIONAL DEFENSE

· · J. W. MULLER · ·





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THE A-B-C OF
NATIONAL DEFENSE

THE A-B-C OF NATIONAL DEFENSE

WHAT THE ARMY AND NAVY
WOULD HAVE TO DO IN WAR,
WHY THEY WOULD HAVE TO
DO IT, AND WHAT THEY NEED
FOR SUCCESSFUL PERFORMANCE

BY

J. W. MULLER

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I

TRAINED MEN OUR MOST URGENT NEED—
THE SIMPLE METHOD FOR SUPPLYING
THEM THROUGH AN ARMY
RESERVE

A DOMINATING principle of the American Commonwealth, though unwritten, is that military power shall not be maintained for aggressive purposes. Therefore all considerations for preparedness are based on the accepted rule that it shall be limited strictly to the strength necessary for adequate defense.

It used to be believed, not only by civilians but by some military authorities, that

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a small army and navy would furnish a safe "nucleus" on which a completely effective fighting force could be built quickly in time of war. This belief made the country contented with its "skeleton" army.

There may have been some sound reasoning in this theory once. There is none now. Modern war has become a matter of such enormously complicated science that civilians snatched suddenly from peaceful pursuits cannot hope to master it in time for emergency. Army movements and battles call for such extreme physical exertions that men accustomed to the indoor life of cities cannot possibly meet the demands until they have had some months of hardening.

Even so far back as the Franco-Prussian War there was a striking proof of the impossibility of enlarging a skeleton army with the flesh and bone of fresh recruits. General Lapasset, in front of Metz, failed again and again to hold posi-

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tions with his brigade, which was made up partly of trained soldiers and partly of newly enlisted men hastily recruited. In desperation, he eliminated the untrained men, sending them to shelter within the fortress. Thereafter, his numerically weakened but now coherent and trained brigade held its ground against the same attacks that had sent it reeling when it had more men in it.

Thus the people of the United States must realize first of all that training is vital. Any project for defense that fails to put it foremost, surely will break down under test. It may be accepted as an axiom that untrained men who go into war hereafter will go not to fight but to be killed.

Courage as an active factor in battle has become almost useless. It is demanded more than ever to hold men steady, but the sheer courage that in the days of short-range, slow-fire guns carried men in a hurraing charge to cap-

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ture gun-positions, can do nothing to-day against batteries three and four miles distant. The bravest men who ever lived cannot charge across an area of three miles whose every foot is sprayed by bursting charges.

Men are not sent into action to die, but to survive. Only training can teach this. A trained regiment whose peace strength is doubled for war by an influx of raw volunteers becomes a maimed organization in the very moment when its highest efficiency is demanded. War is the most inexorable thing that there is. Its inevitable punishment for weakness is destruction.

To give Americans the necessary training, without forming a large standing army or entering on a career of militarism, army experts and political students have agreed on a feasible and easily operated method. This method is to form an army reserve.

The public has been more or less ham-

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pered in understanding the simplicity of the army reserve scheme, because there is so much legislative and administrative complexity of detail about it. These details, however, really are not anything that need to concern the civilian public at all. No matter how much the details may vary, the object of all the proposed legislation is the same. It is simply to assure to the United States the services in time of war of every available man who has been trained by previous service in the regular army.

The method proposed for forming such an army reserve is to cut down the term of enlistment to the minimum period that is needed to make a man a thoroughly trained soldier. As soon as this is accomplished a newly enlisted man is to take his place, while the trained man gets his discharge from active service on condition that he shall be at the instant bidding of the Commander-in-Chief of the army.

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It will be necessary, of course, to pay a certain small sum annually to the men who thus hold themselves in reserve, but the expense will be vastly less, both in pay and in maintenance, than if the Nation attempted to support a big force actively in the army.

An army reserve begun under this system would increase in astonishing arithmetical ratio. Assuming the term of enlistment to be one year, the reserves at the end of five years would be four times the standing army. In other words, for each soldier enlisted in the fifth year, there would be four men in reserve ready for immediate service.

If the power for forming such a reserve were in the hands of the War Department, it is safe to say that it would be in operation to-day. It is, however, a matter that is in the power of Congress alone. It rests with the House of Representatives and the Senate whether the

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United States shall begin at once to build up such a reserve, or whether it shall blunder on as it is doing now and as it has done since the Revolutionary War.

II

OUR THREE LINES OF PROTECTION—SHIPS, HARBOR-FORTS AND ARMY

THE deciding factor in the problem of defending the continental territory of the United States is that there are more than 30,000 miles to defend, all of it coast-line.

No other Nation has a similar defensive problem. The conditions make it impossible for either a navy alone or an army alone to furnish complete protection. Therefore the principle which has been accepted and never altered is that there must be three lines of defense: a fleet, a system of harbor defenses and a mobile army.

Unfortunately the harbor defenses and

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the army have come to be regarded as one, both by the public and Congress. This grave fallacy has led the Nation to fall into the mistaken belief that harbor defense meant defense of the entire coast.

Furthermore, the garrisons of the harbor defenses, known as Coast Artillery, have been counted as part of the strength of the mobile army, which has given a most misleading idea as to the actual size of that army. The Coast Artillery cannot possibly be used to strengthen the mobile army in time of war. It is locked up in the harbor defenses and cannot be moved from them so long as there is a hostile ship afloat.

It is urgent that Americans shall recognize clearly that the harbor defenses and the mobile army have functions that are absolutely different. The harbor defenses are fixed and can operate only against an enemy who seeks them. The mobile army is the only American land force that is free to act against an invader.

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In point of adequate preparedness and efficiency, the present values of the three lines of defense are: (1) harbor defenses; (2) fleet; (3) mobile army.

This is a fatally incorrect proportion. The correct relative values, if every line of defense is made properly efficient, will be (1) fleet; (2) mobile army; (3) harbor defenses.

This means, of course, not that the efficiency of the harbor defenses should be lessened, but that the fleet must be so strengthened that it will serve as the first line of defense, while the army should be increased because in the event of invasion it has to defend the harbor defenses as well as the country.

The harbor defenses lead in efficiency to-day largely because they are matters of permanent engineering. The Corps of Engineers of the United States Army, famous for its achievements, built them so that they are the admiration of foreign experts. Being permanent, they have not

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suffered like the ever-changing army and navy from the whimsical irregularity of Congress legislation. They need important improvements which will be named elsewhere, but their most direct defect is a gross weakness of trained garrisons. If the other two lines of defense were in such satisfactory condition, or so easily to be made perfect, there would be little need for anxiety.

It is regretted by military experts that the name "coast defenses" has been applied so generally to these works. They do not defend the coast. They protect only the very limited harbors whose entrances their guns command. Doing this, they serve entirely the whole purpose for which they are designed. They prevent absolutely an attack from the sea on American ports. They prevent a hostile naval force from establishing any naval base in a secure haven. They prevent a hostile army from landing in a harbor and force it to undertake the hazardous opera-

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tion of landing on the open coast. As long as the forts hold out, they make the harbors a safe refuge for American naval and merchant ships.

Can they hold out? The answer no longer is theoretical. It is the answer that has been given by the Turkish defenses of the Dardanelles to the most powerful battleships of the present day in the first sea-attack—an attack that probably was the most determined effort ever made by ships against sea-coast fortifications.

It has been asked often by laymen why the entire coast line should not be defended by such works, thus putting a stop forever to all danger of invasion. To military engineers such a question appears too absurd to be worth a serious reply, but it is a natural question for civilians to ask.

The reply is simple. The utmost effective range of the 14-inch rifled cannon, the largest sea-coast gun, is 18,000 yards, or a trifle more than 10 miles. Therefore,

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to protect the whole coast, fortifications would have to be built a little less than 20 miles apart if there is to be no gap uncovered by gun-fire. For the 30,000 miles of coast this would mean 1,500 fortifications.

At the valuation placed on Forts Hamilton and Wadsworth in New York Harbor, such a chain of defenses would cost ten billions of dollars to build and arm, and would demand the continuous services of one-half million men, even at the present inadequate rate of garrisoning existing defenses.

It is impossible, then, to protect the American coast with fixed defenses greatly in excess of the existing ones. By far the greater part of the coast line must depend solely on the remaining two lines of defense—the fleet and the mobile army.

III

THE IMMEASURABLE VALUE OF THE FLEET AS THE FIRST LINE OF DEFENSE

ATACK on the United States can come only by way of the sea. Even an attack over the northern border would involve first an overseas operation. America's possessions and foreign interests can be held or lost only by strength or weakness on the sea.

To establish naval defense, the navy absolutely must be powerful enough to seek the foe and attack him. Though the military axiom that attack is the only safe defense is true of the army as well as the navy, it is not fatal to an army to fall back on the defensive, whereas it is fatal to a navy almost always.

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An army may intrench itself, await attack, and win. It lies in the path of the hostile army and the enemy must overcome it before he can proceed. A navy that assumes the defensive can do so only by hiding in a fortified harbor to be protected by coast guns and mine fields. That moment it is eliminated from the war. The enemy need not destroy it. The enemy ships need not even fire a shot at it. They can lie beyond the range of the coast guns, and need simply to blockade it.

It is "bottled up" then, and the enemy owns the sea. He can do what he will. He can move his troop transports and set an army on the coast at his leisure, covering the landing with fire from light cruisers that could not have dared to appear on the ocean before.

A defending fleet that is too weak to fight has absolutely no choice to-day except thus to immure itself. Before the time of aeroplanes and wireless, it had

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another alternative. It could seek temporary immunity in flight, to seize a later opportunity for striking the foe under favorable conditions. But it cannot do so now. The air will betray it.

The daring German ships that held the seas so long without a friendly harbor do not disprove this point. They were serving as roving commerce destroyers, and had nothing to defend. They were isolated ships that could and did supply themselves from their captures. A fleet could not do this, of course.

The American people will do well, therefore, to realize clearly that a defending fleet that is weaker than an assailing fleet must intern or be destroyed. There is no alternative. In all human nature there is a hopefulness that insists on suggesting that some fortunate element may interpose to bring victory to one's own side. Such hopefulness applied to modern naval warfare is a midsummer night's dream.

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A fleet action hereafter will be fearful and quick. When it is ended, the weaker fleet will have been blasted from the face of the waters. If any of its units escape they will not be enough to make a navy for a fourth-class power.

Is the United States Navy strong enough to enter such an engagement with any other fleet?

The answer of the Navy Year Book for 1914, issued by direction of Congress, is given in the following tables:

RELATIVE ORDER OF PRESENT WARSHIP TONNAGE

Great Britain	2,157,850
Germany	951,713
United States	765,133

RELATIVE ORDER WHEN VESSELS NOW BUILDING ARE COMPLETED

Great Britain	2,714,106
Germany	1,306,577

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France	899,915
United States	894,899

The answer is more striking still if the comparison is limited to dreadnaughts. This comparatively new type of ship undoubtedly is the deciding factor in modern naval war. The submarine probably will alter the conditions and strategy of naval campaigns, but when fleets actually meet it will be the dreadnaught that will do the smashing. This monster with its batteries of great guns, more numerous than once were mounted in fortresses, is the destroying angel of the sea.

Great Britain has 20 dreadnaughts afloat and (last autumn) had 16 building. Germany has 13 afloat and 7 building. France has 4 afloat and 8 building. The United States has 8 afloat, 4 building and 3 authorized.

This list is limited to such vessels as the belligerent nations actually had laid down in the normal course of their ship-

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building programs. It is known that they have increased their construction immensely.

If the constant advice of the General Board of the Navy had been accepted by Congress, the United States fleet should consist now of at least 32 first-class battleships and dreadnaughts, all of a type fit for the first line.

IV

CONGRESS AND SHIPBUILDING LEGISLATION

A BOARD of naval officers, known as the General Board of the Navy, organized in obedience to legislation by Congress, laid down a naval policy for the United States in 1903. Although the personnel of this board has changed continually, its members have urged on Congress practically the same policy year after year. Despite this agreement by the country's trusted experts, the policy never has been followed by the various Congresses.

In every other Nation that assumes to be a sea-power, it is an unchallenged principle that a certain definite number of certain definite types of vessels shall be constructed every year. It is recog-

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nized that each year a certain number of warships must be retired, because they have become antiquated, and that, therefore, a single year's interruption of the building program will handicap the navy doubly, by robbing it of its quota of modern ships and forcing it to carry useless vessels.

The record of Congress for twenty-five years shows that it never has adhered to a consistent building program.

The 1890 Congress authorized the first true battleships ever built by the United States. These vessels, *Indiana*, *Massachusetts* and *Oregon*, were consistent types, equal in tonnage, armament and speed. It was a sound beginning.

Battleships were not an experiment. Other navies had been building this type for years and it was established that it was the only type of ship that would keep a navy in the first rank. Yet the Congress of 1891 authorized none, but appropriated money instead for the *Minneapo-*

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lis, a "protected" cruiser, whose type had been practically replaced in other navies by armored vessels. Both type and speed were almost out-dated by the time the ship was launched.

In 1892 Congress permitted the construction of the battleship *Iowa*. This was a good ship, with tonnage, armor and speed greater than in those of the 1890 class, thus taking proper advantage of the advance in naval science. But it was only one ship, when three of this type should have been authorized.

The Congresses of 1893 and 1894 authorized no battleships at all. Thus by 1895 the Nation had 4 first-class battleships when it should have had, afloat and under construction, 15 ships equal to any then in commission.

The record of succeeding Congresses was: 1895, two first-class battleships, *Kearsarge* and *Kentucky*; 1896, three, *Alabama*, *Illinois* and *Wisconsin*; 1897, none.

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Therefore, in 1898, when the Spanish-American War began, instead of having 18 first-class battleships afloat and 6 under construction, as would have been the case had the various Congresses voted three battleships in each year, the United States had 5—*Kentucky*, *Kearsarge*, *Alabama*, *Illinois* and *Wisconsin*—under construction with no possible chance of finishing them for several years to come. The only battleships afloat were the original 4—*Massachusetts*, *Oregon*, *Indiana* and *Iowa*.

The result was that the War Session saw a mad scramble of appropriation to make up in headlong, wasteful speed for years of wasteful indifference. In the previous session Congress had passed a naval bill of some 20,000 words which, while it neglected to provide for a single battleship or cruiser, had gone carefully into such important legislation as appointing "four watchmen for the Naval Academy at two dollars per day each; one clerk

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at the Brooklyn Navy Yard, \$1,400; a colored book, 'Flags of Maritime Nations,' of which 1,300 copies shall be for the Navy Department and Revenue Cutter Service and 3,700 copies for the Senate and House of Representatives."

Now, with war on the country, the 1898 Congress hurled an appropriation of 50 millions forth in one short bill for "national defense." There was a rush to buy freight and passenger steamships, steam yachts and even tugboats. The consequence was such a naval spectacle as probably never was seen in war before.

American naval officers almost wept, and foreign ones laughed. Observers have not forgotten, and will not be able to forget while they live, the wonderful fleet that Admiral Sampson took to bombard San Juan de Porto Rico. There were armored and unarmored ships, each of a different type, age, tonnage and speed. There were "converted" yachts, meaning plain, ordinary pleasure yachts

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that had guns mounted hastily. To crown the absurdity there were coast defense monitors, 10 years old, utterly useless for battle and so slow that at last the war fleet took them in tow. Thus the American Navy by the Grace of Congress went to war.

It is an open secret that later in the war when Admiral Cervera ran out of blockaded Santiago, some of his vessels nearly escaped despite the fact that he had to make his attempt under the worst possible conditions for flight or battle. He had to emerge from the bottle-neck inlet of Santiago, one of the tightest entrances in the world, through which ships can pass only one by one. He had to run with the rocky coast on one hand, precluding any chance for escape by scattering or sudden change of course. Yet whoever has visited the wrecks of the Spanish ships has been astonished at their great distance from Santiago.

The reason was largely that no two of

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the American ships were equal in speed. Between the *Brooklyn* and the *Indiana* there must have been a difference of almost six knots. The speeds of the others varied wildly in all degrees between. With such great differences the swiftest ships could not afford to chase at top speed. In an hour's chase they might have left their slower mates so far behind that they might have given the Spanish vessels an opportunity to turn on them.

That was in 1898. The lesson holds good to-day. Without a consistent building program, followed undeviatingly by every future Congress, the United States will continue to have ships varying so unduly in speed and fighting power that they cannot exert their maximum strength in coherent action. And it is fleet action that wins naval war, not single ship actions.

V

WHAT A "SYMMETRICAL" FLEET SHOULD BE—WHY IT ALONE CAN INSURE EFFECTIVE DEFENSE

UNTIL recent times, it was a practice of governments to carry warships on their active lists as long as they were seaworthy. Naval experts always objected that a warship was not a ship but a machine, and that seaworthiness was only a minor factor in determining its value; but the public, especially that of America, liked to count its navy by numbers and insisted on assuming that every vessel was a good warship while it remained afloat.

A few years ago, largely as a result of the accentuated shipbuilding rivalry between Great Britain and Germany, the

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naval Powers of the world were compelled to recognize that warships reach old age in a period when merchant vessels still are in their prime. In 1910, as a result of carefully tabulated and analyzed experience, it became an established fundamental principle of all naval programs that a warship, no matter how sound and apparently effective it might be outwardly, was past its useful life when it reached the age of twenty years.

The establishment of this absolute age-limit forced an instant readjustment of the values ascribed to ships of all ages between, and made necessary a recognition of the fact that the American first line of battleships was not so large as it had appeared in old lists. But another and more dominating factor than age asserted itself at about this time in a manner not to be gainsaid. It was the sudden and amazing change that came over naval architecture with the established success of the dreadnaught type of battleship.

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In 1906 Great Britain completed her first ship of this type, *Dreadnought*. Until that time the heaviest armament carried on battleships was four guns of 10, 11, 12 or 13-inch diameter in the bore. As late as 1908, after the *Dreadnought*, Great Britain launched two ships carrying only four 12-inch guns in the main armament, the United States completed one, France one, and Germany launched two with four 11-inch guns each. The naval experts still disagreed as to the practicability of so hugely increasing main armament as the *Dreadnought* type implied.

By 1909, however, all the great navies were definitely embarked on the principle of building dreadnaught * fleets, and instantly all previous ships that had seemed monsters before were rendered secondary.

* American naval usage is "dreadnaught" as name of the type. The first British ship of the type was named "Dreadnought."

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As a result, many ships whose age entitled them to be carried in the naval lists as highly modern cannot properly be kept in the class of first line ships; and it has become more essential than ever that a scientific building program be undertaken at once and adhered to by succeeding Congresses.

The armament placed on the dreadnaught to-day would have been considered incredible and preposterous by naval experts of fifteen years ago. It has made such a vast difference between United States ships built within the past five years and those built seven and eight years ago that it would be wholly impossible to form a cohesive or "symmetrical" fleet containing both types. A very simple statement of the existing differences will make this fact clear even to laymen who know nothing whatever about ships.

Let it be assumed that a squadron of eight of the newest United States ships were to attack a squadron of ten ships that

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are nearest to them in age, but were built before the dreadnaught type was accepted. In that case the modern squadron of eight dreadnaughts, *New York, Texas, Arkansas, Wyoming, Florida, Utah, Delaware, and North Dakota*, would muster 20 14-inch and 64 12-inch guns against 40 12-inch and no 14-inch guns on the ten battleships *Kansas, Missouri, Minnesota, Vermont, Connecticut, Louisiana, New Jersey, Georgia, Virginia, and Rhode Island*.

In other words, the eight dreadnaughts could throw more than twice as much metal from their main armaments as could be thrown by the ten battleships. In addition, the dreadnaughts have their main batteries so disposed that they can bring them to bear practically all together, while the older vessels cannot use more than one-half their guns simultaneously under ordinary maneuvering. Thus in reality the ratio is more than two to one against the older vessels. Yet the four ships of the *Kansas* type are only eight

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years old, and the six ships of the *Connecticut* type nine years old.

In the matter of speed, the incoherence produced by only a few years' difference in age may be understood with equal ease. The dreadnaught type ships are 21-knot vessels. The *Kansas* and *Connecticut* type has only 18 knots speed. If a fleet be made up of both these types, the swift dreadnaughts at once lose the advantage of their superior speed because, if they steamed at their maximum speed, they would leave the *Kansas* type ships seventy-two miles behind in twenty-four hours of steaming. This would mean, of course, that, in the event of attack, the American ships would be so far separated that the slower ones could not come up till long after the fight is ended.

Hence, it is plain that the incorporation of inferior ships into a squadron or fleet does not merely weaken the fleet to that fractional extent, but actually forces the entire fleet to assume the weakness of the few.

VI

THE REAL SITUATION REGARDING AMERICA'S DREADNAUGHTS AND BATTLESHIPS

ON October 17, 1903, the General Board of the Navy, having studied carefully the conditions governing foreign and American naval policies, reported that safety demanded an American Navy containing 48 battleships. At that time there were in commission ten battleships, while fourteen were either under construction or had been authorized, the completion of the last of the fourteen being due by 1907.

In view of the building programs of other Nations, it was believed that all purposes would be answered if the United States fleet of 48 battleships were com-

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pleted by 1919. Therefore, the Board recommended that Congress institute a building program of two such ships every year. Such a program would have produced the desired fleet by 1919, without making allowances for replacements.

It was not an extravagant schedule. The 1904 Congress, however, authorized only one ship. The General Board asked the 1905 Congress for 3 battleships in order to make up the deficiency. Congress refused and authorized 2 ships. In 1906 the General Board again asked for 3 and got 1. The 1907 Congress authorized 1. The General Board, now 3 battleships short, asked the 1908 Congress for 4 and got 2. It asked the Congresses of 1909, 1910 and 1911 for 4, and got only 2 each time.

In 1910 there entered the new element of age, experience having proved that twenty years was absolutely the age-limit for warships.

It became apparent that in 1910 battle-

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ships should be laid down to replace *Indiana*, *Oregon* and *Massachusetts*, that *Iowa* should have to be replaced by 1912, and that *Kentucky* and *Kearsarge* should require substitutes by 1915. Accordingly in 1912 and 1913 the General Board asked for 4 battleships in each year, but each Congress authorized only 1, thus increasing the shortage in the original program to 5 and making the entire shortage of battleships nine when counting the loss to be caused by the retirement of *Indiana*, *Oregon*, *Massachusetts* and *Iowa*.

In November, 1914, under the General Board's original plan as modified by the 1910 replacement policy, there should have been 38 battleships in commission less than 20 years old, 7 building, and 2 authorized. Instead, there were only 30 in commission, only 4 building, and 3 authorized. This is a deficiency of 10 battleships from that contemplated in the original program, which, it must be understood, was prepared under the direction of Congress,

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and which has been approved and adhered to by all the naval experts who have successively become members of the board since the original incumbents laid down the policy.

There have been so many conflicting statements about the existing dreadnaught fleet, both in criticism and in defense of it, that the public evidently has become perplexed. The following are the simple, straight facts as to its composition and condition:

The battleship fleet afloat and ready for service consists of 14 ships in the "first line" and 19 ships in the "second line." The "first line" contains the thoroughly modern ships less than 9 years old, which are adjudged to be fit for decisive battle action. The "second line" contains the ships ranging from 9 years to 20 years in age. There should be eliminated entirely from this list *Indiana*, built in 1895, *Oregon* and *Massachusetts*, built in 1896, and *Iowa*, built in 1897. *Kearsarge*, *Kentucky*

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and *Alabama*, built in 1900, while only 15 years old, are well outclassed also, and probably would be retired now had Congress authorized a program that would have provided ships to replace them. *Indiana*, *Oregon*, *Massachusetts* and *Iowa* certainly should not be carried on the list. It is proper, therefore, to say that the "second line" contains only 15 battleships, and it would no doubt be quite just to cut it down by three more.

Of the ships in the "first line," there are 4, *Kansas*, *Minnesota*, *New Hampshire*, and *Vermont*, that do not approximate the other ships of this line in either tonnage or speed, and that are entirely out of the first line class in armament, carrying main batteries of only four 12-inch guns, against the 10 and 12 gun batteries of the others.

Therefore the only battleships that may be held to be actually ships of our "first line" are the battleships *Michigan* and *South Carolina*, armed with main batteries

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of 8 12-inch rifles each; and the 8 dreadnaught ships: *New York* and *Texas*, carrying 10 14-inch guns each; *Arkansas* and *Wyoming*, with 12 12-inch guns each; *Delaware*, *Florida*, *North Dakota*, and *Utah*, carrying 10 12-inch guns each. This makes ten battleships in all in the first line.

These are fine ships, none more than 5 years old. But the situation in the "second line" is different. The ages of these vessels are: one 20 years old, two 19, one 18, three 15, two 14, one 13, one 12, one 11, six 9, one 8, or, if the four ships of the *Kansas* class be listed as of the "second line," as they should be, there will be five of 8 years old. Thus, there are 12 of the 19 ships that are past one-half of their effective age. All these "second line" ships, whatever their age, have main armaments limited to four great guns only.

VII

WHAT BATTLESHIPS CANNOT DO

THE dreadnaught has appealed so much to popular imagination that most of the arguments for a larger navy have confined themselves to discussion of these monsters. But dreadnaughts alone do not make a navy. To be capable for war, a fleet absolutely must contain several different types of ships assembled in correct proportion.

To understand the necessity for this, it is sufficient to understand that war on sea differs from war on land only in details, not in principle. The primary objects of either a sea or a land force are: (1) to discover the enemy, (2) to know his strength, (3) to gain the most advantageous position, (4) to fight him.

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Everybody knows probably that an army, however large it might be, is quite powerless to operate without a big force of scouts and advance detachments. The navy is in exactly the same position, except that its task is far more difficult. Land forces move through country more or less populated where there always are spies and other means of intelligence. The sea force is on an enormous, vague waste, greater in area than a continent. Furthermore, natural conditions on land confine a hostile army to certain known directions of movement. A hostile navy can go where it will.

Therefore, a fleet of dreadnaughts or battleships alone, no matter how powerful, cannot form a useful fighting organization, because battleships are only the smiting force—the heavy artillery, so to speak. When fleets of battleships actually meet and engage, the naval war almost certainly will be decided then and there; but until they do meet,

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the mastery of the seas remains undetermined.

Clearly a defending fleet might as well not exist if it cannot find the enemy fleet. Even if it were immensely superior to the foe, so long as the latter evades it he can sweep the ocean or attack coasts. If the enemy is superior, the naval campaign becomes a game of blind man's buff reversed, the defending fleet trying to escape blindfolded and the pursuer following with his eyes wide open.

It is impossible for battleships to obtain for themselves the knowledge that they must have before they can begin to move. One reason is that it would be suicidal for a commander to detach battleships for scout purposes. The issue of a pitched naval battle probably always will depend on the massed force of great ships brought to bear at one time and place.

Apart from this, they are inferior in speed. Although the giants of to-day have extraordinary velocities, lighter ships with

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the same character of engines naturally always will be faster. For this reason, with the advent of the hugely armored and hugely armed brute fighting ship the light cruiser has attained great importance again—not for any fighting purpose whatsoever, as once was the dream of naval tacticians, but for spying, scouting and patrolling.

Flying machines and the rushing destroyers also act as scouts for “their bullies, the ships of the line,” but their radius of action is limited by their nature. The information that they bring comes from distances so short that the two fleets will be approaching battle. Their reports are invaluable for the execution of the battle plans, but for strategy—the preliminary movements and devices that may enable one side or the other to deliver a crushing blow—their range of observation is far too small.

The needed advance information can be obtained, at the present time, only by large,

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very swift vessels that have a cruising radius as great as, or greater than, the battleship fleet. As an army thrusts a screen of cavalry in front of it, so modern navies thrust enough scout cruisers ahead to investigate every possible sea-area.

It is the mission of scouts to precede a battle-fleet by half a thousand miles and even more, and to send their news back by wireless. Five hundred miles practically is the minimum limit of safety on the sea for such advance scouting if the battle-fleet is to profit by it in time, where an army might be content with advance scouting as little as fifty miles from its front. The reason is that an army would require at least three days to move fifty miles, while a battle-fleet, steaming at 14 knots an hour in fleet formation, would cover the 500 miles in 36 hours.

It is plain that lacking scouts of such great sea-going range, a fleet might, and probably would, blunder into a trap set by a better informed enemy who shall have

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assembled hastily a superior force of powerful vessels.

In the United States Navy no scout cruisers have been authorized since the 1904 Congress authorized the construction of *Birmingham*, *Chester* and *Salem*. These were highly efficient vessels with speeds of $24\frac{1}{3}$ knots, 26 knots, and $26\frac{1}{2}$ knots, respectively. Though they have lost some of their speed, they still are serviceable. Carrying as they do only the armament of two 5-inch and six 3-inch guns each, and not being intended or constructed for fighting, they have not been so seriously out-classed by the advance in naval construction as the big battling vessels have been out-classed in all navies by the mere passing of a few years.

But there are only these three in the whole American Navy. No single other large vessel of equal speed has been authorized by Congress in the past eleven years, though the naval estimates have asked for such ships consistently. The

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report of the General Board of the Navy dated November 17, 1914, repeated the request strongly and asked for an immediate authorization of four such ships, adding that the United States Navy is "peculiarly lacking in this element so essential for information in a naval campaign." There was no result.

VIII

THE DESTROYER—ALMOST NEXT IN VALUE TO THE DREADNAUGHT

IN explaining its naval policy, the General Board of the United States Navy has placed the destroyer as the type of the warship next in importance to the battleship. The story of how this value has been attained by the craft that once was esteemed only as a minor auxiliary, is the story of startling changes in naval theory that have occurred within the lifetime of Americans of middle age.

Not many years ago Kipling wrote one of his most popular poems in description of an imagined battle between the *Clampherdown*, a huge, slow, armored battleship, and a light cruiser that "carried the dainty Hotchkiss gun and a pair o' heels

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wherewith to run." According to Kipling, the light cruiser pranced around the unwieldy giant, silenced its guns and swept its decks.

The poet expressed the opinion of more than one naval expert, and with some show of reason. Big guns still were inaccurate in themselves, as was proved by the famous and inefficient 110-ton guns that the British Admiralty had adopted at about that time, only to withdraw the ships that mounted them. In addition, gunners were poor marksmen. Range-finding and fire-control were largely experimental. Under such conditions, with the slow rate of fire delivered by big guns of that date, speed might very possibly have gained a decision over a heavier but slower and clumsier ship.

But even while people were reciting the verses and deeming them prophetic, conditions were changing. Big guns began to fire accurately by scientific calculation. The day that the first great shells smashed

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in unbroken series into a bobbing target miles away, the hour of the light vessel as a fighting factor had struck.

At that same time the torpedo boat was passing, though it survived a little longer in the estimation of the public and even of naval strategists. This "mist-wraith" that flitted on the midnight sea and struck and fled, not only appealed to public imagination with its fearful possibilities, but kept many an Admiral awake nights. Unlike the submarine, the torpedo boat never had an opportunity in a protracted naval war to prove itself to any great extent; but its existence affected naval construction and tactics immensely, and it inspired the conception of what is now one of the most effective and valuable types in a modern navy—the torpedo boat destroyer.

At first the torpedo boat destroyer was little more than a torpedo craft large enough and sufficiently well armed to be superior to the torpedo boat proper. Thus, the *Bainbridge*, the first American de-

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stroyer, was not quite twice as large as torpedo boats then in use. It carried two 3-inch rapid fire guns and five 6-pounders against the three or four 1-pounders that most torpedo boats mounted. Against the 26 to 30 men carried by the smaller craft, it carried 76 men and 3 officers.

In the beginning the speed of the destroyers was not consistently greater than that of the torpedo boats. For some time naval constructors believed that the latter craft always could be made faster, and even after destroyers were being built largely, torpedo craft still were being constructed with engines that could out-speed the new type. But gradually the destroyer attained velocities that made competition hopeless.

It was this, probably, that relegated the torpedo boat to peaceful retirement. It was not battle-test but experience driven home in maneuvers that demonstrated the superiority of the destroyer. When the United States ship *Gloucester* (a converted

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pleasure yacht) sank the Spanish torpedo boats *Pluton* and *Terror* during the Spanish-American war in fair fight, it was as if the little craft that had been sung throughout the world by poets as the executioner of the battleship vanished finally from the imagination of naval men.

For some years it has been so completely eliminated that the destroyers have quite lost their original prefix of "torpedo boat" destroyers. It is the only thing that they lost. Instead of diminishing in importance with the disappearance of the prey for which they were devised, they gained steadily in engine power, size and armament and finally became an inherent part of the war fleet.

Armed with three and four twin 18-inch and 21-inch torpedo tubes, they have retained their theoretical function of attacking the under-water bodies of armored ships, but this function has remained largely theoretical. Enlargement of secondary batteries on big ships, improved

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gunnery, increased speed and vastly improved search-light systems have reduced greatly the destroyer's chances for successful attack with torpedoes, though it is assumed that in the clamor and smoke of a sea-battle between the giants the destroyer flotillas still may play an important part.

Their more important and certain work that made them valuable was work that the destroyers evolved for themselves. They are scouts now, able to hold the seas in any weather and to steam great distances at maximum speed. While they cannot vie with scout cruisers in this respect, they supplement them with a chain of intelligence that no other form of craft could supply. A secondary but very great value is their value as dispatch boats, which still are needed despite the wireless.

For actual fighting purposes, also, they are vitally necessary, and would have been so had the submarine never been invented. This is because they are absolutely the

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only craft that can fight against their own kind. Against destroyer flotillas the dreadnaughts are almost helpless, because the little ships, nearly twice as fast as the mammoths, can evade them with thorough ease. Therefore, the battleships cannot fall on the destroyers, but can only defend themselves by firing at them with the secondary batteries. Important as this fact makes a destroyer flotilla for battleships, the arrival of the submarine has made it imperative that the big ships be accompanied by them wherever they may have to go.

IX

THE BATTLESHIP'S ONLY SURE DEFENSE AGAINST SUBMARINE ATTACK

OWING to their own value as warships, the destroyers would have remained an inherent part of the modern fleet even if battleships never had been threatened by renewed danger from torpedo attack. With the advent of the submarine, however, they assumed instantly a new and enormous value because they have had to resume their original functions against a new and undeniably terrible reincarnation of their old enemy.

The war in Europe has proved one point to the complete satisfaction of all naval experts—that destroyers are not only the sole fairly certain defense against

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submarine attack on a fleet, but that the very existence of the armored navy may depend on them.

At present the dreadnaught is fatally weak against the undersea torpedo boat, which is all that a submarine is. The battleship's great batteries of rapid fire guns hardly can be considered as defenses, because by the time a dreadnaught's crew sights the periscope of a submarine and fires at it, the dreadnaught's death warrant may already be hurrying toward it in the form of a torpedo.

Armor protection for the hull, increased number of compartments and water-tight bulkheads, torpedo netting of vastly increased strength, sound detectors to warn of the approach of the submerged killer, all are only theoretical at this time. They or some new safeguard may be developed; but to-day the only dependable defense that the dreadnaught has is to keep its engines whirling at top speed that the submarine shall be unable to approach,

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or to so change its course when a submarine is sighted that the latter may be unable to send its torpedoes true.

The modern torpedo has minimized this chance of escape seriously. Its vastly increased propulsive power now makes it possible to launch a torpedo from such a distance that it is practically impossible for the men on the threatened ship to see so small an object as a periscope. The self-steering devices have made the torpedo so automatic after it is launched that it can be set actually to describe curves of known arc so that (theoretically at least) a torpedo can be adjusted to dart around one ship and strike another beyond it.

Against these dangers the battleship has absolutely no protection within itself. Its one and only protection must come from means outside of itself, and these are furnished to-day by only one type of craft—the swift destroyer that can circle around a battleship, sweeping to and fro at distances well at the limit of possible torpedo

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distances, to sight a submarine before it can get its observation and sink to get nearer to its prey.

The destroyer's value for this purpose arises from the fact that the submarine terror can fire its torpedo by no knowledge except such as it has gained by spying its prey through its periscope or by rising bodily to the surface for a glimpse.

In that moment the submarine's crew fixes the location of the chosen ship, estimates the distance, and establishes the exact direction in which the little vessel must approach after submerging. That interval of visibility is the destroyer's opportunity. It is then that the destroyer tries to sink the submarine by gun-fire, ram it, or, failing both these attempts, to shoot away its periscopes, which is equivalent to shooting the eyes out of man's head. Lacking its periscopes, the submarine may dive and escape by running submerged, but it cannot attack.

It is for this incalculable service, then,

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that the modern fleet requires destroyers. Peace maneuvers carried on during past years, and in addition the graphic illustrations furnished by the European war, have assured naval tacticians that destroyers are not merely necessary but literally indispensable.

Under the stress of this need, they have grown into real warships, and so far as quality is concerned the United States is well in the front with such as it has built. Thus, the 6 destroyers authorized by the 1914 Congress will be 1,100 tons as against the 420 tons of the first American destroyer *Bainbridge*. The new ones will, in fact, be almost one-half the tonnage of *Atlanta* and *Boston*, the first protected cruisers built by the United States that served as the basis for the present navy. They will carry four 4-inch guns and a hundred men.

But there are very few of them. It has been established that for adequate defense each battleship needs at the very least four

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destroyers as its special guard. They never must leave it in war. They never must be detached from it for other duty. They must be large enough to go wherever it goes and to hold the seas as long.

Though the American Navy carries 62 destroyers on its list, only 25 constructed and authorized are highly modern craft of more than 1,000 tons, only 26 have a tonnage of 700, and the rest are about 400 tons, which is far too small for oceanic work and confines them rigidly to harbor and coast service. At the rate of 4 destroyers to guard each battleship, the 26 effective armored vessels in our first and second line should have 104 sea-going destroyers ready for battle. As it is, there would be enough to protect the 8 dreadnaughts now in commission. To guard the other 18 vessels of the battle-fleet, there would be left 19 destroyers. It is not extreme to say that this weakness may prove fatal in any operation that exposes the American ships to submarine attack.

X

SUBMARINES—THE NEW AND SUCCESSFUL NAVAL WEAPON

IT was the explosive gas engine, also known as the internal combustion engine, that made the submarine possible. And it has been the lack of a reliable engine with power enough to give the required speed that has retarded, in the United States at least, the construction of the larger sea-going submarines which have proved themselves so formidable in the present war.

This difficulty has been overcome. The General Board of the Navy has reported that it is "assured that engines have been designed and fully tested that will meet the requirements, and builders stand ready to guarantee the results."

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Therefore the United States has begun definitely to build submarines that compare with the original type as the dreadnaught compares with the old unarmored cruiser. These are known as fleet submarines, because they are designed to accompany the cruising fleet, while the old, small type will be known hereafter as coast submarines and will be limited to harbor and coast defense and to occasional activity with the fleet in home waters.

The United States was the pioneer in submarine invention and adoption, but it fell behind quickly in construction. Though the 1893 Congress authorized the building of a boat, *Plunger*, no submarine actually went into commission until 1900. Three years elapsed before any more were placed in commission. By that time England, Italy, France and Russia had engaged vigorously in under-sea construction. By 1904, when Germany adopted the submarine and developed it seriously,

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the United States under-water flotilla consisted of only seven craft.

However, there now are more than 60 built or building. An official estimate made for the Navy Department July, 1914, tabulated the number built or building for foreign navies as: England 84, France 76, Germany 31, Japan 17. It is known, of course, that since then these powers have increased their construction so greatly that estimates would be fantastic, and it may be that when the veil of secrecy is lifted after the war, the United States submarine flotilla will seem comparatively tiny. But submarines can be built in comparatively short periods and their cost is not yet unduly high, although already the estimated expenditure for the sea-going type has reached figures beyond half a million dollars.

So far as size and power are concerned, the sea-going or fleet submarines authorized by the last two sessions of Congress probably will be able to hold their own

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with any foreign craft, unless the belligerent nations succeed in producing a "super-submarine" of which there have been rumors.

The United States fleet submarines of the new type are to be 265 feet long, which is more than twice as large as the old type. Their displacement is to be 1,000 tons, which is within 100 tons of the most modern destroyers and within 486 tons of the United States ship *Dolphin*, which still is in commission. It is calculated that they will be able to accompany the fleet under either peace or war conditions, as their surface speed is to be 20 knots, whereas the average speed of a fleet of dreadnaughts and cruisers is 14 knots in peace and 18 knots in war cruising except when forced draught is used.

The cruising radius of these great under-water boats is to be 6,300 miles on the surface, and 3,200 miles submerged when their speed under electric power will be 12 knots. They will be armored and

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armed with three 4-inch rifles to enable them to fight destroyers on the surface. They will have six fixed torpedo tubes in their hulls, and four on deck in disappearing carriages. In fact, they will be so powerful and efficient that in this very efficiency there will be a grave weakness that demands intelligent attention by the public and by Congress.

The weakness lies in the fact that this new machine has achieved a stage where it is superior to the men who must govern it. It can endure more than human beings can. It carries within itself innumerable and ever-imminent dangers of utter disaster, always menacing and not to be averted except by incessant, expert watchfulness, knowledge and unfaltering skill.

Running on the surface, the least inattention may cause it to founder from taking a sea aboard, for its "trim" always is within a narrow margin of submersion except when all the tanks of water ballast are emptied by blowing out, which cannot

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be done unless the vessel is cruising in absolute safety from sudden attack. When it is sealed and starts to dive, a tiny error in manipulating the horizontal diving rudder may turn it head over end and send it plunging to a fatal depth.

The moment it is submerged, its men are cut off from light and sound—from all the things by which human beings guide and control their actions. The only illumination that they have is the electric light that they make themselves. It is only by continuous and expert reading of gauges and dials that they know in what direction they are moving, how deep they are, whether their bow is pointing up or down, whether they are sinking to a water pressure too great for the vessel's strength whether their air supply is good, whether their water ballast tanks are trimmed correctly, whether they are on an even keel. The electric motors that propel the ship require minute care. Any defect or injury must be remedied at once, and per-

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fectly. The penalty for bungling in a submarine is death, and a horrible one.

If the public will realize that all this is only the constant routine of the submarine, and that there must be added to this in war the strain of going into battle, it will be easy to realize how vital it is that there shall be a highly trained force of men for the work. The submarine, more even than the intricate dreadnaught, has made it absolutely impossible to continue with a haphazard system of forming a naval personnel, or a system that depends on hasty, indiscriminate enlistment and emergency training when trouble threatens.

A dreadnaught has 700 men. There always is some margin for relief, substitution and elimination. The submarine carries only a sharply limited number, every one of whom must be expert. When the fleet submarines go to war, not only must each one have all these men trained to the last degree, but the navy must have within it other equally trained men who can re-

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place instantly submarine crews who are disabled.

The submarine may become the decisive weapon of naval war. Without highly trained crews it certainly will be wholly impotent.

XI

IMPERFECTIONS OF THE SUBMARINE

“**W**HAT has been true throughout all naval wars of the past, and what is equally true to-day, is that the backbone of any navy that can command the sea consists of the strongest sea-going, sea-keeping ships of its day, or of its battleships.” Thus the General Board of the Navy said in its report of November 17, 1914. It repeated not only what the General Board had declared undeviatingly since 1903, but it repeated merely what the lessons of all naval wars in all history have declared.

Single ship actions, or fights between small groups of ships, may make varying fortune of war for months; but the deci-

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sion that means definite victory or defeat will come from a fleet action. And the fleet that wins will win because its ships have superior resisting power and superior smashing power.

"The large increase in submarines is most desirable," said the Secretary of the Navy in presenting this report to Congress, "but nothing in the present war has disproved the Board's faith in the modern dreadnaught."

It is important that the American people shall not be carried away by the romantic thrills caused by exploits of the wonderful submarine. Four times in the history of our existing navy the scientific up-building of the fleet has been halted seriously by enthusiasm over new types of ships that proved fallacies. First came the commerce destroyer fallacy, based on the belief that a swift, unarmored and practically unarmed ship could sweep the seas of enemy commerce and escape enemy warships by running away. It produced

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the almost wholly worthless ships *Minneapolis* and *Columbia*, that soon had to be relegated to the position of training and receiving ships. Then there was the armored naval ram, hailed as the death-blow to armored vessels. There were the armored, heavily turreted, heavily gunned coast defense monitors that cost two million dollars. And finally there was the dynamite-throwing cruiser of which type fortunately only one ship, *Vesuvius*, was built. It was hailed as a wonder of war, and it was an utter failure.

All these appealed almost as powerfully to public imagination in their time as does the submarine to-day. The submarine has proved itself to be an undoubtedly effective and necessary ship, but despite the extraordinary things it has done in the present war, it has not yet proved that it is decisive. It may be that events later on may change this condition; but at this time, the big ship remains ruler of the seas.

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The one positive achievement of the submarine is that it has made blockade mortally hazardous if not impossible. But blockade of the American coast would mean that an enemy already had won the mastery of the sea. If the American dreadnaught and armored cruiser fleet is properly strong, blockade will be impossible and the country will not need to fall back on the desperate expedient of keeping its ports open by submarine defense. In this sense the submarine is far more valuable to continental European countries whose coasts are on narrow seas, easily blocked by close neighbors or raided from near-by bases.

The submarine's second undoubted achievement is as a commerce destroyer. But here again the narrow seas of Europe provide a condition differing from the position of the United States. Furthermore, in the event of an attack on America, there would be no hostile commerce to destroy. The only shipping that would attempt to

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approach our coasts would be friendly shipping, to be welcomed eagerly.

In addition, the United States has been consistent for years in working for a free sea—that is, for an agreement that in time of war all merchant shipping, even though belonging to countries at war, shall be absolutely immune except when it carries actual (not constructive) contraband of war, or if it tries to run an actual close blockade of a specified port or ports. Events appear to be shaping toward a general acceptance of this principle, since the destruction of commerce in the present war has proved itself to cause irredeemable damage to all sides without overwhelming advantage to any.

There remains then for American consideration chiefly the actual fighting value of the submarine against fighting ships. That this is great is undoubted. That it is decisive still remains to be proved. There is no way to know till a test comes whether or not the fleet submarine opera-

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ting in the open ocean during a ferocious fleet battle, can cause preponderating damage before the great guns of the armored ships already have done their destructive work against each other.

The great inherent defect of the submarine is that the moment it sinks under the surface it is as blind as a blind man. There has been no approach yet toward curing this serious weakness. Therefore the submarine absolutely must expose itself to attack by lifting its periscope above water to sight its prey. If the chosen victim is stationary, or moving at a steady speed in a steady direction, the submarine can sink and guide itself with its speed-depth- and direction-indicators so that it can fire a torpedo at the ship which it no longer sees. But if the vessel is immensely swift and holds an erratic course, the difficulty of torpedoing becomes extreme.

The complete failure of the English navy to establish a close blockade of the German coast and the complete success of

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that same navy in guarding perfectly its transport of troops across the Channel, illustrate graphically both the strength and the weakness of the submarine. The lesson to be learned from this illustration is that the United States Navy must have a flotilla of submarines justly proportioned to its capital ships, but that nothing should interfere with the establishment of a proper strength in dreadnaughts and armored cruisers.

XII

BATTLE CRUISERS—THE NEWEST TYPE OF CAPITAL SHIP

WHAT is the battle cruiser? It is a hybrid—an attempt to combine the speed of a cruiser with the smashing power of a battleship. As in all hybrids, it has been impossible to give the battle cruiser the maximum value of the qualities of either progenitor. It is not as swift as a lighter cruiser with equal engine power. It does not carry the armor or the array of guns of the dreadnaught.

The sole question remaining is to determine if it combines enough of the excellent qualities of both cruiser and battleship to make it truly a distinct, new and valuable type.

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Naval hybrids almost always have been failures. In the days of the Armada, the Portuguese scored a failure with the monstrous ship known as *Carack*, which was an attempt to combine the qualities of a galleon and a warship. In the time of Nelson and later in our own early history, it was found necessary to keep corvettes, frigates and line-of-battle ships distinct.

In the history of the modern United States Navy a conspicuous fiasco was the old *Texas*, authorized by the 1886 Congress as a "sea-going double-bottomed armored vessel of about 6,000 tons displacement, designed for a speed of at least 16 knots an hour." At that time foreign navies were building battleships twice as large, and the United States was building protected cruisers of 19 and 20 knots speed. Thus the *Texas* was an anomaly. When completed she was carried on the navy list under the mysterious title of "second-class battleship." In truth she was neither a battleship nor an armored

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cruiser. Her end was that she was used as a target in Chesapeake Bay.

The battle cruiser appears to have developed a certain distinct and noteworthy value. The theory in designing the battle cruiser was to obtain a high rate of speed with a very great cruising radius, and to sacrifice for this purpose only enough armor and guns to leave the ship still qualified for combat with battleships. It was calculated that the inferiority in smashing power and range would be balanced by the superior speed, which should enable the battle cruiser to out-maneuver the battleship.

Up to the time of writing this article, there has been no encounter between battle cruisers and battleships. It is only by such an encounter, fairly fought out, that exact knowledge can be gained as to the ability of the new type for holding the sea in defiance of strong hostile ships, or as to its adequacy in fleet action involving battleships.

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The battle cruiser's absolutely dominating influence as against all classes of warships lighter than battleships, has been fairly well established by the engagement in Helgoland bight, when, during a preliminary and not decisive battle between English and German light cruisers a squadron of English battle cruisers arrived and annihilated the German ships almost instantly. This, however, simply was a proof of the invariable superiority of heavy armor and heavy ships, and was in no sense a test of the battle cruiser as a type.

The most that this engagement may be held to suggest is that the day of light ships passed away when engine construction made possible great speed with heavier ships. The lesson for the United States thus far is that, except for commerce-destroying, the navy of the future has no place for unarmored ships save for scouting purposes, and that the battle fleet should consist of battleships (dread-

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naughts) and armored cruisers of strength that would have entitled them a few years ago to be classed as battleships.

An idea of the strength of a modern battle cruiser may be gained from the following comparison:

English battle cruiser *Queen Mary*, 27,000 tons, 35 knots speed, eight 13½-inch guns.

U. S. first-class battleship (dreadnaught type) *New York*, 27,000 tons, 21 knots speed, ten 14-inch guns.

U. S. first-class battleship (1908 type) *New Hampshire*, 16,000 tons, 18 knots speed, four 12-inch, eight 8-inch and twelve 7-inch guns.

An examination of this list will indicate that speed is the outstanding quality of the battle cruiser as against the battleship of dreadnaught type. At present there is not a single armored cruiser in the United States fleet with a speed greater than 22 knots. The heaviest armament of any of these is four 10-inch and sixteen 6-inch

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guns. All told there are only 11 of even these inferior vessels and only six of them are less than ten years old. Congress has provided for none since 1904.

XIII

CESSATION OF MISCHIEVOUS MEDDLING BY CONGRESS THE FIRST NEED OF THE UNITED STATES NAVY

“SINCE 1900,” says George von L. Meyer, former Secretary of the Navy, “the United States has spent one billion, six hundred and fifty-six million dollars on the navy, while Germany had spent only one billion, one hundred and thirty-seven millions for a more powerful one. A fair amount of this difference may properly be charged to the heavier costs for men and material in the United States, but by far the larger part of the difference cannot be so explained.”

Where has the money gone?

It has not been stolen during construc-

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tion, nor has it been embezzled in the Navy Department. Congress and Congress committees, ever watchful of Government departments and ever ready to investigate and expose, never have even insinuated either dishonesty or incompetence in performance there. Americans have fallen into the habit, with good reason, of pointing proudly to the honesty and fidelity of their army and navy.

The money has not been stolen, but wasted. It has been wasted not in paying too much for construction, but in constructing too much that should not have been constructed and in maintaining too many useless or not highly useful vessels. There is no dispute among naval men all over the world of the statement that for the amount that has been spent, the United States should have to-day a navy ranking second only to Great Britain.

There is no possible room for dispute, either, as to where the fault lies. The facts are on record in the records of

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Congress. They can be comprehended in an hour's examination of the reports made to Congress by Secretaries of the Navy, by the General Board of the Navy and by other officers. Anybody, even the most careless layman, who will read the recommendations, appeals and warnings in those reports and will then read the naval bills as passed by the various Congresses, can learn from the record of those Congresses as set down by themselves, how the appropriating body has labored to bungle, to hinder and to waste.

Republican and Democratic Congresses have accused each other of failing to provide this or that number of ships, but the true damage to the country has not been in this direction. It has been and is in the manner of the appropriations. No man, however partisan, can point to the records and say that any Congress, whatever its political complexion, was better or worse than any other in this matter.

In selecting the record of the second ses-

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sion of the 63rd Congress as an example there is, therefore, no intention of criticizing that body particularly. As a matter of fact, it authorized the construction of 3 dreadnaught type battleships, 6 excellent destroyers, 1 fine fleet submarine and 7 coast submarines—a good record of construction compared with previous Congresses. The same evil faults that exist in its method of appropriating money for the navy, exist in the acts passed by all other Congresses.

The total naval appropriation act of June 30, 1914, contains 14,000 words. Of these, just 270 words were used for appropriating money for the ships mentioned.

The rest of the long Act was devoted to prescribing in detail exactly how the Navy Department might spend the other sums that are needed annually for its maintenance. Four hundred words were used for prescribing puny expenditures, such as purchases of ice, stationery, photo-

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graphs and "religious books." Five hundred words were expended on the participation of the fleet in the Panama-Pacific Exposition festivities. Two hundred words were devoted to the important matter of birth certificates to be produced by candidates for enlistment. One hundred words prescribed just how clothing outfits should be furnished to enlisted men.

The appropriation for the maintenance of naval auxiliaries (a purely administrative detail of any Navy Department) was loaded with a clause enumerating 41 uses for which it might be spent, going into such utterly trivial and routine details as "compasses and compass fittings." The appropriations for the four training stations and the war college were burdened with the same petty detailed orders.

In this Act there were such vastly important laws as the provision of \$360 for paying the annual wages of a laborer, "four scrubbers at \$192 each," "one chief laundress at \$240." Altogether, this one

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clause providing in rigid detail for such insignificant matters (total amount \$22,696) had 140 words devoted to it—a little more than half the space devoted to appropriating for ships worth \$33,410,000.

It is this sort of legislation to which every Congress has given more time and attention than to an intelligent building of a great navy. It has not only tied the Navy Departments of all Administrations in a paralyzing web of red tape, causing immensely wasteful clerical systems, but it has prevented the experts who alone know how a navy should be made from using any money as their knowledge and experience might suggest. It is Congress, and not the Navy Department, that “runs” the Navy, and after Congress adjourns, its dead hand remains heavily on the whole naval system in the form of these narrow Acts which no naval authority and no President may transgress under penalty of being punished for violation of the law.

Ex-President Taft, once a Secretary of

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War, speaking from experience, said last June: "I heartily concur in Mr. Meyer's suggestion that Congress allow some discretion to the Executive, under the advice of a General Staff, in the expenditure of money appropriated for the naval establishment. One of the real difficulties we have had in building up a navy has been the little knowledge of naval matters that members of Naval Committees in the Senate and the House have had, which has proved to be a dangerous thing. We have available the finest experts in the world. Why should we not make use of them? The expenditures would be subject to thorough and prompt investigation. No President, Secretary of the Navy and General Naval Staff could possibly waste the amount of money that has been wasted under the present system."

Why has no Congress ever done this? The answer is: Politics.

Why is there no General Staff of the Navy, as demanded for years by all naval

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men—a staff such as every foreign power has as a matter of course? Mr. Taft's answer, and Mr. von L. Meyer's answer, are that "the same Senators and Congressmen at whose door can be laid the logrolling extravagance in naval expenditures were bitter in their opposition to a General Staff."

XIV

THE UNITED STATES NAVY A CREATURE WITHOUT A HEAD

PROBABLY the most terrible fleet that ever sailed to attack a country was the Spanish Armada. It had the vastly superior numbers, the crushing power, the size and armament that should have made victory certain. But it was not organized. Its Admirals had only general plans. Its captains, excellent sailors though they were, had not been trained in fleet and battle maneuvers. Its men were brave, but they could not shoot.

The little English navy never could have won in stand-up battle. It won because its Admirals and Captains worked together in a manner that is an object lesson to this

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day, because all its units acted in accordance to comprehensive plans, and because its men, though they could shoot only fairly, shot so much better than the Spanish that there was hardly room for comparison.

To-day every navy in the world, British, German, Austrian, French, Italian, Russian, Japanese, Turkish, and even the smaller South American navies, are organized. Each has a General Staff, or what amounts to a General Staff, whose plans are ready, who study their own and rival fleets every day and change their plans as changing conditions arise, and who govern the Navy, not spasmodically as ordered by meetings of legislatures, but constantly.

The only navy in the world that has no such organization is the navy of the United States.

If war occurred with any degree of quickness, the fleet would have to be handled in a haphazard way under a system of control devised in a hurry. Plans for

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squadron action, for fleet action, for single ship movements, for mine laying, for mine sweeping, for meeting an enemy or maneuvering for delay, all should have to be made in the desperate manner in which all work has to be done when war threatens its swift strokes.

The Chief of the Bureau of Navigation has reported that in time of war at least 160 officers should remain ashore if the efficiency of the fleet at sea is not to be fatally impaired for lack of trained men to attend to its innumerable and instant necessities. No provision has been made for this force.

The navy to-day is managed by seven bureaus—the Bureaus of Navigation, Construction and Repair, Steam Engineering, Ordnance, Yards and Docks, Supplies and Accounts and Medicine and Surgery. A large part of the time they work not only without co-ordination but actually at cross-purposes. They cannot help it. In fact, the greater the efficiency of

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each, the greater must be the endeavor of each to overbalance the others.

In one hour Congress could authorize the creation of a General Staff to bind all these bureaus together. But if such a General Staff is created, it will wrest power from Congress. A General Staff will not fail to object to the construction and maintenance of Navy Yards that have only 19 feet at low water when the draught of battleships is from 26 to 29 feet. It will not countenance annual and ever-varying laws as to the relative ranks of commissioned and warrant officers from gunner's mates to chaplains. It will assign construction to navy yards according to the ability of those yards, and not according to the political influence of the constituencies whose interests demand business for their navy yards.

That Congress, representing the nation, shall always rule and govern the navy is proper. It is imperative that the people shall dominate their military establish-

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ment. But it is certain that the public of the United States desires only to rule its navy, and not to manage it. For the purpose of management it trains officers at great expense. On the Naval Academy at Annapolis alone the country spends more than eight million dollars a year. Congress has taken a large part, and a most important part, of this management out of the trained hands and placed it in the hands of committees, many of which have been merely political and all of which have been ludicrously ignorant almost always of naval science.

Therefore if future Congresses appropriate money for ships without also providing for expert management of the navy under a General Staff, the money again will be largely wasted. Construction without reorganization is to pile armament on a rotten base. Every ship built under such political rule is penalized before it is launched, by a percentage of inevitable and incurable inefficiency.

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Fortunately, this matter, which is absolutely vital though it is not so spectacular as launching dreadnaughts, is something that every citizen can grasp without needing technical knowledge. Congress will provide for such common-sense management of the navy by naval experts if the public makes its demand felt.

Rear-Admiral Fiske, testifying in 1914 before the Congress Committee on Navy Affairs, said that the lack of plans and control in the navy was such that quite without regard to the number of ships or supplies of material, the navy could not be prepared to meet a highly effective enemy in less than five years.

It is only fair to say that many other naval officers consider that his views are extreme; but it certainly is safe to say that the navy could not be made efficient for war within six months.

Had England required as much as three months to prepare her navy, she never would have put a man into France, the

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Dardanelles or Africa. Instead, she would be fighting now to save her own island—and it would be a forlorn hope. It was the readiness of her navy that made the struggle possible for her.

XV

THE AMERICAN NAVY'S ACTUAL SHORT- AGE IN IMPORTANT SHIPS

IN the preceding articles the writer has tried to present the actual and minimum need of the navy without regard to the extremists who wish to build up a monster navy because of the European War. In summing up herewith the numbers and kinds of important ships that are required urgently, the figures are based not on the European armaments evolved during the struggle, but on the fundamental principles laid down in 1903 by the General Board of the Navy when there was no excitement over war or preparedness.

BATTLESHIPS.—The building program

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of 1903, modified to meet changed conditions in 1910, called for the formation of a battleship fleet to number 48 capital ships by 1919, no ship to be more than twenty years old. The United States Navy to-day is short 10 battleships from this program, counting in those that have been launched recently and are not yet in commission, those that are partially completed but still on the ways, those that are being begun, and those that have been authorized by Congress but have not yet been laid down. If *Oregon*, *Indiana*, *Massachusetts* and *Iowa* are dropped from the list, as they should be, the shortage will be 14 battleships.

It will be impossible now to catch up by merely authorizing 2 battleships annually between now and 1919. The best record of construction ever made was attained with the battleships *Delaware* and *North Dakota*, which were in commission within 3 years and 2 months after authorization. Some of the battleships, however, have

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required 5 years for completion. The average period from authorization to commission is about $3\frac{1}{2}$ years.

Had the navy been well organized and administered during the past fifteen years, it is possible that the nation might have its full quota of dreadnaughts now for the money that already has been spent.

DESTROYERS.—Counting 4 destroyers as the absolutely necessary guard for a battleship, there are needed 104 sea-going destroyers for that service alone. There are ready, building and authorized, only 57, half of about 700 tons and half of 1,000 tons. This is a shortage of 47. Just how many more seagoing destroyers there should be to form flotillas for independent action, is an open question. Certainly there should be enough to form two “divisions” of 12 destroyers each.

FLEET AND COAST SUBMARINES.—It may be assumed that the present building program is satisfactory and that what is most required is construction that shall

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permit the retirement of old and inferior types. Possibly it is fairly correct to say that there should be immediate further authorization of 3 fleet or sea-going submarines and 10 coast submarines to replace old ones, exclusive of new ones to be added.

ARMORED CRUISERS.—Whatever may be the final lesson taught by the battle cruiser, a line of armored cruisers of great speed is essential for every navy. To protect American commerce against commerce-destroyers; to drive enemy commerce from the sea; to fight in the second line of battle; to act as scouts against a fleet that protects itself against lighter scouts with swift armored ships of its own, the armored cruiser of maximum swiftness and maximum fighting power is a known potential factor to-day. The United States has none quite equal to the modern armored cruisers of foreign navies. None has been built by the United States in 11 years, when the *Montana* type

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was commissioned. This ship and the *North Carolina* of the same type and date are, however, assumed to be fairly good ships of their kind still.

The construction of ships with at least 25 knots speed, and possibly 28 knots, armed with batteries as heavy as those of the present second line American battleships, would provide the navy with vessels equal to most foreign ones of this type, and inferior only to foreign battle cruisers. The relative number of such cruisers is an open question. The British list indicates that its Admiralty has worked on the policy of providing one armored cruiser to two battleships. The German Navy has only about one to four battleships, but it is known that the German Admiralty had neglected this type for dreadnaughts. France carries 20 armored cruisers to 30 battleships but has built only 7 cruisers in the last ten years as against 23 battleships in the same period.

SCOUT CRUISERS.—Counting *Chester*

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and *Birmingham* as still efficient, though they are 11 years old, there should be at least 4 new scouts authorized with speed sufficient to defy armored ships which now are being constructed in foreign navies of 30 and 32 knots speed.

In addition, the navy needs are for a fleet of oil-fuel ships. The only oil-fuel ship in the navy to-day has 10 knots speed and cannot accompany the fleet. There are seven colliers, fitted to deliver some oil. Between them they cannot supply enough oil within 3,000 tons per month of sea service. The only submarine or destroyer tenders are improvised ships. The only hospital ships are *Solace* and *Relief*, both improvised during the Spanish-American War and both of small use, *Relief* being unseaworthy.

XVI

WHAT THE UNITED STATES HARBOR DEFENSES ARE

DURING President Harrison's term (less than 10 years before the Spanish-American War), the writer was in Fort Hamilton, one of the defenses protecting the entrance into New York's upper bay, when news arrived that the United States had sent an ultimatum to Chile demanding satisfaction for an attack on American blue-jackets by a mob. At the time there was on the sea an armor-clad just built in England for Chile.

"If that ship wants to steam into New York harbor," said one of the artillery officers in the fort, "she won't need to pay any attention to us, though we fire every

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gun here and every gun in Fort Wadsworth across the way. She needs simply to keep her men under cover. Our round shot couldn't harm her."

Both these Narrows defenses, then the only ones that existed for the great harbor, were armed on that day with cast-iron, muzzle-loading smooth-bores, most of which had been mounted during the Civil War.

There were guns building then in the government gun works at Watervliet, New York, that were destined to change this. To-day Forts Hamilton and Wadsworth may be ranked justly among the big harbor defenses of the world, though the coast defenses of Great Britain and Germany probably are vastly more powerful. The two "forts" have been supplemented as defenses for the southern entrance to New York by Fort Hancock, situated almost twenty miles south of the city on Sandy Hook and guarding the entrance to the lower harbor.

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Equally powerful defenses protect the eastern entrance to the city, the entrance to Long Island Sound, Narragansett Bay, San Francisco and Puget Sound. Defenses with heavy but lesser armament protect enough other harbors to bring the number of efficient defenses to about 22. A great gap exists in the fact that the entrance to Chesapeake Harbor is unprotected. Despite continual representations to Congress, nothing was done to correct this until a recent session authorized the acquisition of land on Cape Henry.

This, however, may be said to be the only gross defect in the American harbor defense system that will require years and much money to cure. The other defects may be remedied by the adoption of a sensible schedule of management and maintenance.

The creation of this system had its inception in 1886, when the Endicott Board laid before Congress a plan for harbor defenses worked out by the most eminent en-

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gineer officers of the army. So correct were their ideas that hardly any changes in principle have had to be made, although they prepared their plans when guns still had sharply limited range and when there hardly was such a thing as fire control or elaborate searchlight installation either on ships or land.

The only real change in principle has been to eliminate from the plans a certain number of floating defenses, the board having recommended either armor-clad floating gun-batteries or heavy vessels of the coast monitor type. The provision for these was due partly to the fact that the United States had no navy then, and little prospect of any; but a more direct reason was that no guns then proved could shoot far enough to protect all channels from the land.

A great American achievement corrected this defect very suddenly. It was the production in the government works by army ordnance experts of an all-steel

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rifled cannon, 12 inches in diameter at the muzzle, that could fire a conical, hardened steel projectile weighing 1,000 pounds to a distance almost undreamed of before that time. The writer was present when the first gun of this type, under test at the Sandy Hook Proving Grounds, threw its projectile five miles into the Atlantic Ocean. Later, under improved powder and firing conditions, these weapons have developed ranges of 13,000 yards, which is $6\frac{1}{2}$ nautical miles or a trifle more than 7 land (statute) miles.

At once the need for floating batteries disappeared. There was no channel that could not be protected by the fire of these truly American weapons. There was no ship then afloat that could dare venture within their range. There was no naval gun that could outrange them.

Another American invention that came almost at the same time caused the only other great departure from the Endicott Board plans. They had provided for huge

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steel turrets to protect the guns, because the only mountings known for coast guns were fixed carriages. The new invention produced a gun carriage that could swing the enormous 12-inch gun up to the firing position as if it were a feather, and withdraw it again in the very instant that the projectile cleared the muzzle. Immediately the highly expensive steel turrets became unnecessary. It became quite sufficient to mount the big guns in a sunken emplacement open to the sky and protected simply in front with mountain-like masses of earth, fortified with steel and concrete.

This merely structural change has given the American defenses their visible character. Instead of works dotted with steel shields like the backs of mammoth turtles, the United States harbor defenses are tranquil, beautifully sloped hills and terraces with not a hint of armament.

Oddly enough, the only radical change in American defense construction that is suggested to-day is the suggestion that

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turreted protection be reconsidered. There still is small fear that fire from the sea, even with modern accuracy, could "get" a great coast gun in the brief instant of its elevation above the parapet; but increased accuracy, increased power and number of ships' guns indicate that their fire may search the tops of the gun emplacements much more closely than had been considered possible heretofore. A fleet of 8 modern dreadnaughts could throw 118 large-caliber projectiles against a single target in one minute. While none of these shells might strike the gun or even fall into the hidden emplacements, it is urged that fragments of bursting shell and smashed concrete will endanger the gunners and disable the numerous installations needed for operating great guns.

XVII

WHY THE AMERICAN HARBOR WORKS CAN BE TAKEN FROM THE BACK

IN the wide and sometimes vehement discussion of National unpreparedness, much stress has been laid on the fact that American harbor defenses can be taken from the back, meaning from the land side. The public should not be misled into imagining that the works are wide open in the back, and that anybody can walk in. They are constructed to withstand a quite formidable assault by such landing parties as warships might put ashore when operating exclusively as a fleet not accompanied by troop transports.

It is, however, quite true that the defenses can be taken from the back by a

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military force of any considerable size provided with fairly heavy guns. That this is so is not a defect of the works. It is a weakness of the mobile army, whose function it is to resist such an attack and to prevent even the possibility of it. The harbor defenses were built to fight ships, not men. They are not fortifications. Huge though they may seem, they are nothing but huge gun-mounts.

There are no fortifications, properly speaking, in the United States, nor are any contemplated in any scheme of defense. A fortification is a great, complete circle of protective works arranged either to surround an important city or to hold a strategic point that an enemy cannot dare to pass until the fortification has been reduced, or, if he has a sufficiently large army, until he has invested it. The theory is that if he invests it, he must leave there a far larger number of men than the defending army needs to leave inside of the fortress. Thus, while the garrison holds

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out, the invading force must carry on its other operations with a heavily diminished army. The immediate result of forcing an enemy to invest a fortress is to weaken him as effectively in everything except morale as if he had been well mauled in a severe action.

Of course there are many other functions of fortifications. They serve as pivotal bases for mobile armies, as supply bases and as protections for lines of communication or retreat, but these are aside from the question. The point is that the American harbor defenses function as fortifications only in the sense that ships cannot pass them to seize the harbor and cities behind. If a combined naval and land force can set troops ashore on the coast outside of the fire-zone of the defenses, the latter form no factor that the invader needs to take into account. He needs not invest them, unless he wishes to open the harbor to his ships. He can march past them, leaving them intact, and

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they can create no danger because they have no army within them that might sally from their protection to cut his lines of supply or assail his forces.

Should he wish to invest them, he need spare only a very small force, because the garrison of the defenses is small even when at its maximum. If he can do these things, it will be not because the harbor defenses are weak, but because the mobile army is weak.

If the American harbor works prevent ships from forcing their way into the harbor, they serve their full purpose. So far as this second line of defense is concerned, the nation's sole problem is to make them fully adequate for the work.

As regards construction, they may be said to be efficient. The matter of steel turrets for the guns still is an open question that will not concern the public till experts have agreed on it. No other vital structural changes have been urged. It is proper to say that American army en-

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gineers believe that the works are excellent.

In armament little has developed during the present war to shake the American army's faith in the powerful 12-inch steel mortars which form a prominent part of the gun installation of all the first-class defenses. They throw a 700-pound conical pointed steel projectile with "high-angle" fire, making a plunging bombardment that ships always have most dreaded and that they dread still, for even the most mightily armored dreadnaught is weaker on its deck than along its sides.

The effect of 700 pounds falling with vast velocity from a height of a mile or more (caused by its curving flight) may be easily imagined, especially when it is remembered that the shell carries a giant bursting charge as well.

Ships have not yet attained any armament that will enable them to use "high-angle" fire. They cannot carry mortars. As there are sixteen of these weapons in

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a battery, and all can be discharged simultaneously, they bear within them potentialities of utter destruction for the ship that falls within their range.

Not highly esteemed at first for accuracy, mortar fire has attained so high a degree of reliability that it is assumed that a good gun-company with good fire-control and range-finding should score four hits out of five shots at 5 miles. The extreme range of these guns is more than twice that distance.

The largest gun for direct fire mounted at present in American defenses is the 12-inch. It still is highly efficient, though there is no doubt that it is outranged by the modern 15-inch guns carried on the latest type of dreadnaughts. It must be remembered, however, that naval guns cannot vie in either range or smashing power with coast guns inch for inch of caliber. The naval gun cannot attain maximum elevation, because of structural conditions in the ship. It cannot throw a

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projectile equal in weight to the projectiles that can be thrown by land guns of the same caliber.

The 12-inch gun, it is established, can be so mounted on an improved carriage that it can attain a maximum range of 21,000 yards, which is the range of the 15-inch naval gun. The projectile, however, would have to be reduced to 700 pounds, thus entailing a diminution of destructive power.

The 14-inch gun now being successfully built in government works will give equal range with a heavier projectile and will have the added and most important advantage that the powder pressure in the chamber is much less, which will give it a far longer life than the 12-inch gun possesses. It costs little more to build. If expense were not an obstacle, possibly it would be well that 14-inch guns should be mounted not only in all the new defenses, as they will be, but should replace all 12-inch guns in other defenses.

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But there is a very decided consideration—and that is that all the armament in the world is useless without effective means of operating it. It is in effective means for handling even the present armament that the American harbor defenses are weakest.

XVIII

HARBOR DEFENSES IN ACTION

MODERN great guns are not fired by sighting along the barrel. That method went out soon after the Civil War.

To understand how impossible it would be to sight a coast gun that way, the reader must conceive himself to be standing on the parapet of a harbor defense work that is about to go into action against ships.

He looks out over a vast, blank semi-circle of water without a single mark on it to serve as guide for direction or distance. Away off on the line of the horizon are the masts and parts of the hulls of ships.

Let him fix his eye on one. It is a

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dreadnaught 575 feet long and its fore-castle deck is sticking 26 feet high above water; but if the observer on the parapet holds a lead-pencil in front of his eye, the distant vessel will be blotted out completely.

That, then, is the target—a mark less in apparent size than a lead-pencil. The 12-inch gun that is going to fire at it is 17 inches thick and it is going to throw a shell half as large as a man. In addition, the distant target is moving incessantly and in as irregular a manner as possible, varying course and speed continually to disrupt the gunner's aim.

It is evident that the mere human eye can do nothing. How is the gun aimed? It is not "aimed" at all, properly speaking. Its men do not see the ships during the whole engagement. They do not even see the ocean. They are down in the pit of the gun emplacement.

The men who do the "aiming" are not near any of the guns. They are stationed

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along the coast, at opposite sides of the defenses. Their stations, carefully concealed, are known as "base stations;" and a straight line drawn between them and through the defenses gives what is called the base line.

Of what is it the base? It is the base of a triangle. Now it will be obvious that when the observer at each end of that line looks at the distant ship, his line of sight will establish another straight line, or a leg of that triangle. Therefore, when each observer with his ingenious range-finding and direction-finding instruments has fixed the exact angle of his line, the ship will be at the apex of the triangle thus calculated.

That, told very crudely, is the principle on which the work of range and position-finding is founded. The exact angle once obtained, the establishment of the exact range is a mere matter of mathematics—intricate but positive, and very quickly done by modern apparatus.

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All that the gunners and the officers in the batteries can see is the sky overhead. All that they are trying to hear is the buzzer of the telephone instruments that will convey to them the orders from the fire-control stations. They wait with every nerve concentrated on one thing—on catching instantly the order that shall tell them, “lateral deviation, so-and-so-much, so-and-so-much elevation . . . fire!”

Their gun, adjusted in the pit, is tossed up by the mammoth steel arms of the carriage. It is a violent motion, propelling the huge thing upward like a pebble in a sling. But it stops, dead, in its firing position as if it had been stopped by a velvet hand. There is a stunning explosion. Before their ears have fully heard it, while the emplacement still is ringing and shaking with it, the gun has been snapped back, jerked down into the pit and is in the loading position.

The gunners do not know if they have hit or not. They may have sunk the dread-

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naught. They will know nothing about it till the telephone tells them.

Their business down there in their pits is to make their glistening, oil-sweating, burning hot, complex engine ready again instantly. While some wash out the chamber, others are hoisting the half-ton projectile on its chute and preparing to send it driving into the breech. Still others are ready with the long bars of brown powder. An expert is putting the new primer into the breech to fire the cannon with electrical spark. Engineers are examining the oil and air pistons of the mammoth mechanism. Every man's brain and every man's hand are working to achieve the utmost in fractions of minutes.

They are watching the swung breech that looks like the steel door to a safe deposit vault and is almost as complex. They are standing by the batteries that are to fire the gun. They are standing by the wires that are placed everywhere to govern fire control, explosion, lighting and

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communication from a dozen different places.

Every one of these innumerable installations is threatened constantly with injury. The explosion of their gun shakes the emplacement like an earthquake and may tear the wiring like a storm. There may be half-ton projectiles pounding on the works or on their very parapets. Fragments and rubbish may pour on them and bury them temporarily. Everything in that pit is being subjected to the most fearful destructive attempts that man ever has devised.

The habit, the nerve-force and the concentrated skill demanded to fire coast guns in such conditions, cannot be improvised. They must be there, ready from long previous training, when the need arises. How many men who are thus trained has the nation?

XIX

THE SOLDIERS OF THE SHORE—THE COAST ARTILLERY

THAT part of the land army to which is entrusted the operation of the harbor defenses is known as the Coast Artillery. For many years Congress and the Nation have counted it as merely a part of the regular or mobile army. Under the stress of necessity the army organization itself has been obliged to use the Coast Artillery for field army purposes. An attempt was made even to deplete the already grossly inadequate force by using part of it for siege artillery corps.

It was like trying to increase cash by transferring it from one pocket to another. The expedients, forced by poverty of men,

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have diminished and disorganized the Coast Artillery without doing the mobile army the slightest good.

The functions of the Coast Artillery are radically different from those of the field artillery which belongs to the mobile army. Where the field artillerists must be horsemen, the Coast Artillery must have men trained as boatmen, for a most important part of harbor defense is mine-planting, cable-laying and even coastal scouting. They must have experts in explosives, for while the field artillery is served largely with "fixed" ammunition (projectiles and powder ready cased in brass like cartridges), the great guns are loaded in detail, the projectile going in first and the powder afterward. It is delivered from the ammunition galleries in bags which must be ripped open that the big bars of powder may be packed into the gun-breech properly. In addition, the Coast Artillery must load its projectiles with the bursting charges.

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All this is highly dangerous work, and apart from the danger great precision is demanded, for an error in the loading means infallibly a failure of the projectile to attain the calculated range.

Where the field artillerists have a fixed target, and can fire without further shifting of guns after they obtain the range, the coast artillerist has a target that shifts constantly. He has no natural object that will serve as a guide to range and direction. Every shot that he fires must depend on a new calculation; and this calculation must take into account the movements that the ship will make between the moment of fixing its position and the moment that the projectile reaches it.

This involves a knowledge of naval tactics and of the speed and other capacities of hostile ships. The scores of complex problems that are presented to the range-finders and controllers of fire in a coast battery are too technical to be susceptible

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of explanation here. Many thick books have been written about them. But one simple example may serve to indicate the closeness of computation demanded for putting a coast battery into effective action.

When a 12-inch mortar fires, its projectile ascends first toward the sky, mounting so high that it disappears from sight. Then it curves and descends to plunge on its mark. If the range is maximum, the projectile will be in the air a full minute. In that one minute a ship maneuvering at 14 knots an hour will have moved 1,386 feet; that is, a dreadnaught of the *Oklahoma* type, which is 575 feet long, will be more than twice its length from its original position. Thus the coast artillery actually must fire at a spot that the ship has not yet reached when he discharges his weapon.

Of course most of this difficult and highly scientific work falls on the officers and not on the men. But the Coast Artil-

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lery is short of officers, even under the "peace organization," which in turn is far short of the strength that actually would be needed in war. At the minimum computation made by the Chief of Coast Artillery, the shortage in officers was 856 in 1914. The shortage is greater now, because men have been withdrawn from the continental defenses to man the Panama, Hawaii and Philippines works.

Among the enlisted force, also, there is urgent necessity for highly specialized men, such as electrician sergeants, master gunners, master electricians, wireless operators, and men trained expressly for cable work, search-light operation and the handling of submarine mines.

So short is the Coast Artillery of men, that the army has been unable to form anything like even a small fairly permanent force of this class of specialists. There are not men enough, as a matter of fact, even to act as mere garrisons for the defense system. As the Chief of Coast Ar-

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tillery said in his last report, "unless provision is made in the near future for additional Coast Artillery, it will be necessary to reduce the garrisons to mere care-taker detachments at some of the defenses, including Portsmouth, Delaware, Charleston, Savannah, Key West, New Bedford, Potomac, Tampa, Columbia, Cape Fear and Mobile."

The garrisons in some of the defenses already are little except such "care-taker detachments." Thus one company (104 men) was the force last autumn in Fort Rodman, which is supposed to defend Buzzards Bay and the rich manufacturing district of Massachusetts behind it. Even the immensely important and immensely expensive works defending the eastern entrance to New York City had only six companies which under the present maintained strength numbered less than 600 men.

The truth is that the inadequacy of men in this branch of the army has been for

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many years a shocking instance of American carelessness. Not only has the Coast Artillery been inadequate to man the continental defenses, but the nation actually has spent millions of dollars for defenses in Panama and the foreign possessions without adding a single man to the strength for garrisoning the works. Therefore the home defenses, long so naked of men as to present tempting opportunity, have been further depleted to man the foreign possessions—and, naturally, these in turn have only a minimum of the men who should be in them.

When all the foreign defenses have been garrisoned thus inadequately, there will be only “one-third of one relief” left for the continental defenses. That means that even without casualties there will not be enough men to relieve those who become worn out under the intense strain of a modern bombardment. It means that if a hostile fleet is determined, and is willing to expend the ammunition and guns and

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risk a few ships, it can wear out the garrison in 48 hours merely by incessant successive attacks, even if its fire does not injure a single gun.

XX

HOW A HARBOR DEFENSE IS ATTACKED

SHIPS that attack a harbor defense do not approach in stately order. They do not stop when they fire. Their endeavor is to swing at speed toward the works in a great circle whose point nearest the defenses shall bring them just within firing range. Before the projectiles have ended their flight, the ship will have rushed out of range and will be circling out to sea to sweep around again for another discharge.

That brief moment when the attacking ship is within range is the only moment in which the coast guns can "get" her. They will not, however, be fired unless a particularly favorable opportunity pre-

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sents itself. They may withhold their fire indefinitely and permit the ships to pound the works, in the hope that they will venture in to closer range.

In such a contest, the harbor defense has the advantage. True, the harbor defenses present apparently a big target which is fixed, and the ship is a tiny target which is moving swiftly. But the difference in size is only apparent. Though there may be a mile and more of the defense works, the only vital parts of them are the hidden guns or gun emplacements and even if these were visible, they would present only a microscopical mark. The rest of the works might be battered for days without suffering any fatal injury.

As compared with this, the ship, though a small mark, is vulnerable in every part. A single well-placed direct-fire projectile may injure it seriously, if not mortally. A single blow from a mortar projectile, falling from the sky, almost certainly will wreck it.

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Therefore while a fleet that is battering defense works may score a hundred hits to a single one from the coast guns, the single projectile that strikes a ship may do more damage than a hundred or even two hundred missiles that strike on shore.

Where the greatest dreadnaught yet launched can measure the thickness of its armor belt only in inches, the harbor defense can measure its armor of steel, concrete and earth in yards.

An attacking fleet, however, will employ tactics that are more dangerous than bombardment. It will strike not at the guns alone, but at the eyes that guide and control the fire of the guns. It will strike at the range-finding and base stations and at the search-light installations, to disrupt the fire-control system.

As explained in a previous chapter, the range-finding stations are out-lying posts. Comprehensive search-light systems also demand a certain number of search-lights

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situated outside of the defenses, sometimes miles away from the guns.

An attacking fleet will inevitably send light draught gun-boats or destroyer flotillas along the shore to wreck these stations. It is an accepted part of sea-attack on armed coast forts. Taking a chance on escaping the fire from the heavy, comparatively slow coast guns, the swift little ships will dash in to dismantle the stations with a torrent of fire from light quick-firing guns, or they will endeavor to cover the landing of raiders that shall assault the stations and destroy them.

If they succeed in doing it, a harbor defense will be maimed almost as much as a submarine is maimed when its periscopes are shot away, or as a field battery is maimed if its observers and range-finders are killed. Lacking fire-control, the big guns are engines without direction. Their chances for a successful shot are reduced to a minimum.

The danger of these sharp, dashing

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raids is especially imminent at night. As soon as darkness falls, the harbor works must be on their guard in all directions. There is only one possible method to make such a guard effective. It is to have a search-light system installed by the most capable engineering and artillery experts, and so complete that there shall not be a gap of darkness in all the area that possibly can be attacked. A gap is an open gate; and it will be impossible to conceal that open gate from any alert enemy.

Long before the flotillas come in for the real attack, the enemy fleet will have been making feint attacks by striking quick blows at every part of the line of defense. Big ships and little ships will engage in this work, which is known technically as "attacks to develop weaknesses." Let them discover such a weakness, and they will make a determined, elaborately planned and desperately conducted assault on it in the first favoring night.

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The importance of success will be vast. Therefore such an attack will not only be made with all possible force, but the attempt will be masked by simultaneous attacks from the whole fleet against all other parts of the works. There will be furious large-gun fire from the armored ships, to engage every possible man in the batteries. There will be bold raids on the mine-fields to force the focusing of attention of the force in the mine emplacements. Small vessels will dash into search-light zones, perhaps to perish, but certainly to compel expenditure of men and ammunition that are needed elsewhere.

One need not have military knowledge to picture what such a night will be like in an American harbor defense that is undermanned, whose search-light system is not complete, whose fire-control is not perfect and whose mine-fields are not adequately protected by search-lights, rapid-fire guns and gunners. The great guns forced to fire at in-rushing dreadnaughts that do

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not intend seriously to attack but inevitably will force the entrance if they are not driven off; the smaller guns firing up and down the beach at half a dozen attacking flotillas; the mine-fields invaded by reckless mine-sweepers and counter-mining boats; base, range-finding and search-light stations telephoning and telegraphing for men to guard them—and not enough men, not enough search-lights, not enough ammunition!

XXI

WHAT THE HARBOR DEFENSE SYSTEM LACKS AND NEEDS

CHESAPEAKE BAY DEFENSES.—Nine years ago a joint board of navy and army officers appointed as the National Coast Defense Board, reported unanimously to Congress that the entrance to Chesapeake Bay demanded strong protection. "The importance of securing the entrance at Cape Henry," said the board, "as an outer line of defense to Baltimore, Washington, Newport News, Norfolk and the great railroads crossing the Susquehanna River at the head of the bay, cannot be exaggerated. It was recognized in the report of the Endicott Board (1886). Any expenditure, however great, is justifiable for such vast interests."

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The National Coast Defense Board consisted of George W. Goethals, then Major on the General Staff; General Crozier, Chief of Ordnance, an expert recognized throughout the world; General Mills, Chief of Artillery, equally capable; General Greely, of the Signal Corps; Generals Story and Mackenzie, and Captain Sperry, of the Navy.

No nation could desire more competent advice from more competent men, but the Chesapeake Bay defenses are not built yet, or even begun. It was only recently that Congress authorized the first step toward it.

COAST ARTILLERY.—The authorized strength of this branch of the Regular Army never has been the strength that was needed to man fully the defenses of the continental United States. It always has been a Congress provision that the Coast Artillery Corps of the Organized Militia was to furnish the manning details

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for 50 per cent of the gun and mortar defenses on the Atlantic, Gulf and Pacific Coasts.

This theory as to the militia has remained a theory. Last June the militia of the coast States was short 11,000 of the number that would be required. Even if the organizations were raised to war strength, there would remain a deficiency of 5,000 men.

Some of this militia coast artillery is excellently well trained, considering its limited practice. Some is useless. Perhaps there is no sharper range of quality than exists in this branch of the citizen soldiery. Of the 450 officers, some 290 hold War Department certificates of proficiency in one or more courses, and almost 1,400 men have qualified as master electricians, engineers, master gunners, gun commanders, gun pointers, plotters, observers and first-class and second-class gunners.

But the efficiency of the organizations

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is in unsatisfactory relation to that of individuals. Militia Coast Artillery companies as they exist to-day in very many of the States are not qualified to take their place in the defenses or serve guns till they have been re-organized and drilled.

The aggregate enlisted strength of regulars needed to garrison the harbor defenses is reported by the Chief of Artillery as 24,000. The actual number available was 14,633 in November, 1914. The enlisted strength of regulars required to man the defenses in foreign possessions then completed or about to be completed, was 6,000 and the actual number there was 2,500.

"There are now provided about one-fourth of the officers and one-half the enlisted men necessary to provide for our primary home defenses," said the Chief of Coast Artillery near the end of 1914.

TWELVE-INCH STEEL RIFLED GUNS.—The maximum range of these with the present carriage, firing a 1,000-pound pro-

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jectile, is 13,000 yards, or 7 1-3 land miles. A comparatively inexpensive modification of the carriage will permit an elevation which, with a 700-pound projectile, will give the gun a maximum range of 21,000 yards. Despite the insistent allegations of enormous ranges attained by naval guns in Europe during the present war, ordnance experts agree that this range will be quite equal to any likely to be achieved by a dreadnaught. It will, in fact, be equal to that of the new 14-inch guns that are building, whose maximum range with light projectiles is stated as being about the same, while with their standard 1,660-pound shell the 14-inch guns can achieve only 18,000 yards, or slightly more than 10 miles.

AMMUNITION.—The amount of ammunition available in the harbor defenses or provided for by appropriations up to November, 1914, was for the rifled guns, 73 per cent. of the allowance fixed by the

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National Defense Board, for mortars, 50 per cent. of the requirements.

FIRE-CONTROL SYSTEMS.—Seven harbor defense commands have received a thoroughly good, standard fire-control system. The fire-control installation of the continental defenses, viewed as a whole, is 40 per cent. incomplete.

SEARCH-LIGHTS.—The Chief of Coast Artillery reported last autumn that the search-light project for all the defenses was only one-half completed. "The deficiencies in the matter of fire control and search-lights," said the Chief of Staff in his last report which was sent to Congress by the Secretary of War, "are of the most serious character. As a matter of fact, proper fire control and search-light installation is maintained in only a limited number of first-class defense areas, the remainder of the fire-control systems and search-light equipment being deficient or improvised."

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To sum up, the harbor defenses as at present constructed, established or under course of construction, are partially adequate in rifled guns, practically adequate in steel rifled mortars, and 83 per cent. efficient in material for submarine mining.

They are grossly weak in men. Their next vital defect, and one which cannot be cured in haste when war threatens, is the insufficient fire-control and search-light equipment. Third in order of importance is the deficiency in ammunition. This last deficiency is serious, but it can be remedied more quickly than the other defects, which will require not merely money, but much time and work.

XXII

THE MOBILE ARMY—WHAT IT IS

THE title "mobile army" defines an army that can be moved freely, as distinct from forces such as the Coast Artillery, which is a fixed or "territorialized" army. But "moving" an army means far more than merely setting it in motion. It is not enough that the men are mobile. If it simply were a matter of moving, the mobile army in the United States to-day could be moved by the organization of any great American passenger railroad with less trouble than often is encountered in moving a metropolitan holiday rush.

The daily movement of commuters in and out of cities like New York involves the handling of far more men than the 30,-

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ooo men of which the mobile army force within the borders of the whole United States consists to-day.

A mobile army must be capable of being moved as an army. It must be in such condition and organization that it can be delivered at a given place in a given time with all its component parts—its infantry, its cavalry, its artillery, its signal, engineer and sanitary corps, with all their weapons, ammunition, horses, mules, wagons, ambulances, clothing, bedding, tentage, supply trains, telegraph and telephone outfits, railroad-building, bridge-building and other engineering outfits, mining material, observation balloons and gas containers, aeroplanes and gasoline, surgical instruments, medicines, field kitchens, forage, even lanterns.

A huge part of this material must be actually with the moving army, ready to be sent ahead of it to facilitate its operations, or with it to serve the army on the firing line. The rest must be within reach,

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not "going to arrive," but actually on the lines of supply.

The army moving in time of war must absolutely move as an entity independent of everything and everybody else. Whatever is needed is needed at once. There is no time to hunt for it in the country that is being traversed. The army needs practically everything that citizens need every hour and every minute in daily life, and it needs, in addition, innumerable things that war demands. If these are missing, the penalty that war exacts is disaster.

There is a great deal of free and easy talk about an army "living on the country." What it really means is that every army usually tries, as a matter of policy, to subsist as much as possible on the food supply of occupied territory in order to conserve its own supplies; but no commander would dare to depend on the country around him unless he were forced to do so by desperate circumstances as if

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when he retreats headlong, leaving his food behind to save his men, or if the opportunity for an immense success tempts a General to take such an equally desperate chance with his pursuing troops.

As a matter of fact, an army that tried to-day to live on even a friendly country would be facing starvation within a week, if not within forty-eight hours. The proof of this is furnished every winter when railroads happen to be blocked by snow. Within twelve hours the cities suffer a milk famine. Within twenty-four hours meat and other fresh foods become scarce. Whenever a disaster overwhelms any district and cuts off the railroad lines of supply, the cry of famine sounds from the stricken places almost before the details of the occurrence become known.

Scarce as it is, food is the only needful thing that a moving army could expect to get at all. Almost all other army necessities are so highly specialized that such equivalents as could be furnished by the

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country would not serve. Even such material as would serve cannot be furnished in the needed quantities. Military equipment could not be obtained under any circumstances.

Therefore even the American army moving through its own country must have with it all that it needs immediately, if it is going into action. All the supplies that may and will be rushed to it within a few days will not serve the demands of battle, which are that every man on the firing line shall have instantly what he wants. If the army is short 10,000 rations or cartridges or bandages in the hour of the fight, it will not be of any avail to know that one million rations, cartridges or bandages will arrive the next week.

The equipment must be there. The infantry must have the field artillery with it, big enough and supplied well enough to protect it and save it from being pounded helplessly to bits by the enemy. The cavalry must be there, the scouts must be

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there, the aeroplanes must help the scouts and the artillery.

It is such work that the great Generals in the present war, Joffre, French, Hindenburg and Mackensen, have been doing—not as a part of their strategy, but as a mere incidental business of their more important work. They did not learn it on paper. They learned it by trying it in time of peace, by finding out what could be done and what could not be done.

They, and what is more important, their subordinates, learned it in the great peace maneuvers that the European nations have held as a matter of course. There never has been in the United States anything even approximating these enormous tests, which is all that the maneuvers are. Where American officers have handled regiments, the European officers have seen, every few years, not mere brigades or divisions but all the army corps of their countries set into motion under stern supervision that admitted no excuse for the

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breaking-down of commissariat, ammunition supply or engineering material or for the failure to deliver complete army organizations ready to fight in the destined place at not only a designated hour but sometimes actually within a period set by hours and minutes.

In these tests every military theory is put to the proof, everything that has been learned academically is practiced and almost every contingency that war possibly could provide is discovered and must be met. Consequently, the officers of Europe know, from doing it, scores of things that our own officers know perfectly well from intelligent study, but never have had opportunity to see or try. Ludicrously small as the mobile army of the United States is, the whole army never has been together in one time and place in all its history.

Even in the Spanish-American War the strength of the army that finally was assembled to go to Cuba was only about 16,-

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ooo men. The second expedition to the Philippines was 4,800 men. The concentrations on the Mexican border brought together a "maneuver division" of 13,000 men in 1911 and a "division" of 11,000 men in 1913.

Why has the army never been assembled for a test of its officers and men? The answer is: "Army Posts!"

XXIII

ARMY POSTS AND WHY THEY STAND IM- MOVABLY IN THE WAY OF IMPROV- ING THE ARMY

EVERYBODY in the United States would laugh if a Congressman should propose that the naval students in Annapolis be ordered by law to confine their practice to row-boats; that naval lieutenants be limited to commanding tug-boats; that Captains be placed in charge of little gun-boats only; and that Commodores and Admirals be limited to single-ship commands, all on the understanding that on the outbreak of war these men shall at once take command of dread-naught fleets.

If, in addition, the Congressman should

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add that until war occurs none of these officers shall have the opportunity of seeing a dreadnaught fleet assembled, no doubt the country would demand that the Representative be interned in a lunatic asylum as soon as possible.

Yet exactly this is what the country and Congress is expecting of its West Point men.

When the West Point cadet is graduated he must go to an army post if he is to be assigned to the command of any men at all, for there are no regular soldiers stationed regularly anywhere except in army posts. Since there are 49 such posts, with only 30,000 men to garrison them, it can be computed easily that the posts cannot possibly average more than 600 men each. Transfers and other exigencies may at times leave certain posts with less than 100 men in them.

Therefore after he leaves West Point the young officer enters active service under conditions that actually assemble a

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lesser number of men for drill or maneuvers than he saw at West Point, which has more than 600 students. Captains and Lieutenants command skeleton companies. These in turn do not even assemble with other companies of their own regiment, because the army posts force a wide distribution. It is actually true that Colonels who wanted to see their own regiments have had to travel through the United States to do it—and sometimes they could not see the whole regiment then, for parts of it might be scattered from Alaska to the Philippines.

Generals of Brigade in the United States Army cannot hope to have a brigade assembled anywhere, except by fortunate chance. There never has been a genuine army division assembled in the United States in time of peace. The troops that were sent to Cuba were far from being a division in numbers, and their formation only approximated a division. The skeleton army of peace remained a skeleton

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division in war, and some of the parts were missing from the skeleton.

The divisions that have been assembled on the Texas border during the past few years of disorder were not divisions numerically, and despite all the intentions and efforts of the commanders to give them a genuine divisional organization, it was necessary to draw on the Coast Artillery for some of the component parts.

The establishment of a military line on the Mexican frontier was a welcome opportunity to the army, not because it promised a fight, but because it offered the chance at last of assembling a respectably large body of men and giving many officers their first commands under real army conditions. It may be assumed, therefore, that the War Department and the army did its best to collect as many men as possible, and to form as nearly perfect an organization as possible.

Yet despite all their efforts, the division that was ordered out in 1911, and that was

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to have numbered 19,000 troops, mustered only 11,000 twenty-five days after the orders for concentration were issued. Thirty days later still, it had grown to 12,600. It reached its maximum strength only after 85 days had elapsed. That maximum strength was 12,800. Six months later it was disbanded, never having come within 6,000 men of the strength intended for it.

Part of this shocking condition was due to the insignificant size of the army available within our own borders. But a greater part of it was due to the army post system. Not a single part of that "division" was in the same place as any other part. Infantry companies, cavalry troops, signal corps, hospital detachments, engineers, field artillery batteries, all had to be collected here, there and everywhere.

Nobody of intelligence would expect all the parts of a machine to fit if they never had been assembled. It is exactly so with

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the army. These scattered troops may be likened to beautifully made, perfectly polished pieces of mechanism kept in splendid order by workers in forty-nine widely separated parts of the United States, who cannot possibly know how their particular part will fit into the whole.

There never has been dispute of the fact that the officers have done their best with the fragments under their charge. Foreign military men who smile at the American "army" testify at the same time to their high respect for the ability of the American army officer. It was not boasting when Lindley M. Garrison, Secretary of War, at the end of last November's report which was filled with blunt statements of our gross weakness, said that "our small army is unquestionably in as excellent condition as any similar number of men in any other military establishment in the world. Were it not for a desire to avoid invidious comparisons, I should say that man for man it is better than any similar

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existing establishment in the world. I do not believe that any one will dispute the statement that the army never has been in better condition than it is to-day, from the most recently enlisted man up to the highest officers."

If the need should come to-morrow, these officers would be able, without doubt, to entrain these excellent enlisted men at the various posts in record time. They would deliver themselves, without doubt, at the point of mobilization in perfect condition, with all their equipment so far as it is available in the posts. But what will happen when each of these perfect, isolated units arrives?

Each individual fragment, so well trained to take care of itself as a unit, must immediately become part of a mass which it never has met. Add to this picture the arrival of militia organizations arriving from different States, each of which has had its own ideas as to organization and supply—or none at all. Surely the scene

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can be visualized by any citizen, even if he never touched a gun in his life.

It will be like dumping in one huge, mixed-up, swiftly growing mass all the parts of a mammoth and immensely complicated engine to be assembled in deadly haste by men who never in their lives have tried to assemble such an engine and who never have even seen such an engine completely assembled and working.

XXIV

CAN THE AMERICAN ARMY BE MADE READY FOR WAR UNDER THE ARMY POST SYSTEM?

THE army post system has been upheld in Congress despite all protests, though the arguments in favor of it do not allege that the posts are of the least military advantage from a strategic point of view, or that they are of the slightest benefit to the training or organization of the American army.

There are two chief arguments in support of the system. One is that the posts represent an enormous investment which would be a total loss to the nation if the posts were abandoned. The other is that their abandonment would mean heavy

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loss, if not financial ruin, to many communities that have been built around them or that base a large part of their existence on them.

The latter argument has been assailed bitterly as merely an argument in favor of political graft. It should be considered, however, that the communities which demand the retention of the posts are a part of this nation and that they are entitled to appeal to their fellow citizens for protection of their interests. They are without doubt good Americans like the rest of the population, and it would be unjust and ungenerous to believe that they deliberately wish to sacrifice any vital interest of their country to their own personal advantage.

In so far as their Representatives speak for their views legitimately and openly on the floor of Congress they do only their duty. But unfortunately the matter has become part of the political give-and-take of Congress. Army officers, the War Department and even Presidents have

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learned to be chary of attacking the army post system, because Congress appears to have made the retention of the posts one of its jealously guarded prerogatives. It is quite true to say that many high army officers fear to say anything for publication against the army posts, because they fear that the politicians will get after them for it.

What are these army posts? The location of some dates back to British rule, when they were established to defend the frontier against French and Indian raids from Canada. Most of them go back to the Indian wars in the west. Some established later were established almost openly as a matter of politics.

Their absolutely useless geographical location is illustrated by merely naming their sites, such as Arizona, Idaho, Wyoming, Texas, Utah, Kansas, South Dakota, Montana, Nebraska, Oklahoma, Minnesota. If they had been placed deliberately to be as far away as possible from

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any spot where the army might be needed to defend the country against invasion, they could not well have been placed better.

There is not a military argument in their favor. In 1911 the Secretary of War told Congress that "nearly all these posts have been located for reasons which now are totally obsolete or which were from the beginning purely local. They have universally been constructed upon a plan which involves a maximum initial cost of construction and a maximum cost of maintenance both in money and men."

The remark about their cost is justified. Fort D. A. Russell in Wyoming cost nearly 5 millions to complete. This amount would have built a sound harbor defense for one of the United States ports. It would have paid for a good part of the cost of building defenses for the naval base of Guantanamo, Cuba, which at this time is absolutely undefended and lies wide open to attack from even a third-class fleet.

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The annual cost of these posts in maintenance alone is a heavy item, all of which is wasted so far as any military advantage is concerned, with the exception of providing excellently for the health and comfort of the troops. They are little cities, provided with their own water supplies, sewer, lighting, heating, telephone and telegraph systems. They have beautifully graded streets and lovely green terraces and lawns. Some of them look like parks.

Every year the appropriations for the posts grow in amount. Congressmen compete with each other in their care for the posts within the territory of their constituents. Thus annually the investment of the nation becomes greater.

The War Department suggests that the great increase in the land-values since the foundation of the posts might go far toward balancing the loss accruing from their abandonment and might even pay a part of the cost of re-locating the army

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in the better geographical sites that are demanded for efficiency. There have been no statistics or estimates collected to present the case clearly enough for judgment. It can only be suggested that even if the abandonment represents a large loss, the United States long ago accepted the industrial principle that it pays far better to "scrap" an inefficient machine or plant than to muddle along with it, when a better method is indicated clearly and is demonstrated as being ready for use.

Such a method is ready. It has been ready for some years. It has been within the knowledge of Congress for years. It has been presented to the House of Representatives and the Senate not once but many times. It is neither of doubtful value, nor complex, nor expensive. In fact the War Department has proved to Congress that the proposed method would produce an annual saving in the cost of army maintenance of \$5,500,000.

This proposed method of replacing the

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wasteful and useless army posts, and the results to be gained from it, are so simple that every American citizen can understand them.

XXV

WHAT ARMY EXPERTS WANT IN PLACE OF THE ARMY POST SYSTEM

INSTEAD of small, uncombined troops scattered in 49 widely separated posts, the military authorities of the United States want to bring the soldiers together in six or, at the most, eight large groups in such stations that they can assemble easily for joint training and in emergency be sent to a point of concentration in the quickest possible time and with the least expenditure of money.

As a basis for such a re-location of the army, the authorities name the following three territorial areas as being best for the defense of the United States:

(1) The line between the St. Lawrence River and the city of Atlanta, Georgia.

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Troops stationed there would cover the Atlantic seaboard and could be thrown to a threatened point in the minimum of time.

(2) The line between Puget Sound and Los Angeles, to protect the Pacific seaboard.

(3) The line between the Great Lakes and the Rio Grande, which would place soldiers not only convenient for border service but would have the more general advantage that the troops there would be ready as reserves for either the western or eastern sea-boards.

Under this territorial department system, there would be two or perhaps three groups of troops in department 1 and in department 2, while department 3 would have at least two groups.

Each group would be properly assembled; that is, each would consist of a brigade of infantry with its scientifically correct proportion of cavalry, artillery, engineers, signal corps and quartermaster's and sanitary troops.

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Under this plan, instead of 49 uncoordinated fragments there would be not more than 8 completely assembled large army parts which could be put together almost instantly to form the only large fighting organization that really is fit to offer in battle—the army division.

This simple and business-like plan would do much more than merely to form the army into compact, quickly available organizations. It would be an economy, since it would save approximately \$5,500,000 a year in maintenance, as mentioned in a previous article. It would make recruiting far easier and would greatly simplify and accelerate the education of recruits and their incorporation in the active army. It would improve vastly the training of the trained army.

Among still other important advantages, it would be a very great step forward in the improvement of the National Guard or organized militia, because the army groups would be stationed where the

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local militia could join them easily in maneuvers.

As the army is stationed to-day, the organized militia cannot get the benefit of seeing much if anything of the regulars, or of participating in their work. Militia officers, who are desiring more and more to get regular army tuition, must travel long distances at serious expense and loss of time. Joint training of militia and regulars is possible only when the government can afford to dispatch regular troops to some point convenient for the citizen soldiers. So little money is appropriated for this that joint maneuvers are few and far between, though they have been recognized by both regulars and militia as being of the utmost value.

The wide value of the plan for concentrated grouping of the army was presented most lucidly in 1912 by the Secretary of War, when he said plainly and positively to Congress that the army posts were wasteful and worthless. He reported

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that if the mobile army is to be efficient, its distribution must meet the following requirements:

(1) It must be favorable for the training of infantry, cavalry and field artillery combined.

(2) It must be favorable for the rapid concentration of the whole army on the southern or northern frontier or on either sea-coast.

(3) It must favor the best use of the army as a model for the general military training of the National Guard.

(4) It must favor the use of the regular army as a nucleus for the war organization of both the National Guard and of such volunteers as may have to be raised in time of emergency.

(5) The distribution must favor economical administration to give maximum efficiency for the annual expenditure on the army.

(6) The distribution must favor a peace organization which will be effective

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in war, that is an organization that will permit a prompt expansion by means of a system of reserves.

Most important, however, and in fact vital, is that a proper location of the army groups would make possible a formation of each group in correct military proportion of all arms. This subject is one that lacks the romantic or sensational interest pertaining to such matters as shortage of ammunition or guns, but it strikes at the heart of army efficiency.

An army that is not capable of being put into action instantly in complete tactical formation when needed, is not an army though its individuals may be perfect. The army that needs time is half defeated already. Time is the one thing that a capable enemy does not mean to give to his opponent.

Until now the supporters of the army post system have succeeded in burying every proposed legislation looking toward this sane, practical and really vital reform.

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The army cannot be organized as an army under the army post system. It is as impossible as it would be to conduct a business establishment with each employee in a different street.

XXVI

THE ARMY DIVISION—WHY IT, AND IT ALONE, IS AN EFFECTIVE FIGHT- ING FORMATION

ALL army formations from the company to the division have been devised with one object, which is to combine numbers of men in such assemblage that their united action shall be as nearly as possible equal in quickness, ease and certainty to the act of one completely efficient man.

Thus the company, the smallest administrative unit, should move and strike like one single man with the strength of a hundred. The battalion should strike like four such super-men and thus should deliver a blow equal to that of a man four

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hundred times as powerful as an ordinary human man.

Concentration of power and the ability to wield that concentrated power quickly, underlie all the tactical formations of every army. They are the fundamental reasons that have caused practically all nations to organize their armies into organizations within organizations—companies, battalions, regiments, brigades, divisions, and, finally, the field army, which is the sum of them all.

Details such as the numbers of men in each formation vary according to the military judgment of various nations. It is quite possible that American ideas may be altered more or less after the lessons of the European war become available. Such changes, however, will be matters for technical experts to consider, and not for the people.

Whatever they may be, the principle of army organization will remain the same. The European war, misleading though

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most of the statements from the belligerent nations necessarily are, has established the fact that the fundamental principle of constructing an army has not changed.

This principle of construction is as follows:

INFANTRY, 4 companies make 1 battalion, 3 battalions 1 regiment, 3 regiments 1 brigade.

CAVALRY, 4 troops make 1 squadron, 3 squadrons 1 regiment, 3 regiments 1 brigade.

FIELD ARTILLERY, 4 guns and 12 caissons make 1 battery, 3 batteries 1 battalion, 2 battalions 1 regiment, 2 regiments 1 brigade.

ENGINEERS, 4 companies make 1 battalion, 3 battalions 1 regiment.

None of these alone makes an army. Infantry without cavalry would be without a guide. Cavalry and infantry with-

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out artillery would be pounded to bits. Artillery without engineers could not cross a stream that a barefoot boy might wade.

Infantry, cavalry, artillery, engineers and their auxiliary troops, such as signal corps, quartermaster's and sanitary troops, etc., by themselves are only the limbs of an army. If they are not assembled, they compare with a true fighting force as a mass of separate arms, legs and eyes would compare with a fighting man.

Again, just as a fighting man would be useless if he had three arms and only one leg, or all his arms and legs but no eyes or no stomach, so the various army formations are lacking in efficiency unless they are assembled in exactly the right proportion.

This comparison is not intended to be humorous. An army going into battle has before it the same conditions on a gigantic and terrible scale that confront the pugilist who enters the ring. His fists are useless if his feet are not quick enough

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to carry him swiftly in to assault or to carry him as swiftly away if his opponent's blows fall too heavily. His feet and fists combined are useless if his stomach is not good enough to give him endurance. If his eyes do not tell him what his adversary is about to do, all his other powers are handicapped, perhaps fatally.

The formation that gives the fighting force all its limbs is the division. It alone has the scouts that are the eyes, the infantry that is the hard body, the artillery that is the terrible fists, and the supply trains that provide endurance.

If the army post system can be displaced, a divisional organization of the regular army can be effected even though it suffers from its present inferiority of men. It will remain a skeleton army, but it will be a skeleton that is articulated. While it remains distributed in the army posts it is not a skeleton at all. It simply is a scattered lot of bones of a skeleton, with many bones missing.

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If an emergency calls to-morrow for a sudden assemblage of those parts, the efforts to do so will involve an amount of work and delay that must inevitably make the Nation curse governmental red tape and bureauatic bungling. Yet it will be only the simple unavoidable result of the present system.

The orders for assemblage will have to pass from General Staff to department commanders, from them to other commanders, and so on till they reach the post commanders. All orders for assembling supplies must go through the same course. When the movement starts at last, each little detachment will have to come by a route different from every other. The distances to be covered by the various units will vary from hundreds of miles to thousands. Their supplies will have to be sent from depots situated here, there and everywhere.

When they reach the place of concentration, the only officers who know anything

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about them will be their own garrison or post officers. The officers who are to command the mass will have to be drawn from departments, from bureaus, from government assignments in New York, Washington, New Orleans, San Francisco, Seattle, and perhaps a hundred other places.

If the army posts system is dropped and the army groups are stationed in 8 places in formation as brigades with all their tactical proportion of infantry, cavalry, artillery and other arms correct, there will be none of this mess. The whole army could be set into motion within twenty-four hours. Before thirty-eight hours had elapsed, the groups would be converging on the point of concentration, and, having arrived there, they would need no disruption or organization. The brigades would fall into their places and the division would be ready.

And the orders required to do all this would be just one telegraphic message

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duplicated to the Commanding Generals of the Eastern, Central and Western Departments, and reading: "Send your Division to ——."

XXVII

WHY THE "PEACE STRENGTH" OF THE REGULAR ARMY IS DANGEROUS WEAKNESS

THE "peace strength" of the regular army, which is referred to so often, is a system long accepted under which the standing army in peace has only a stated percentage of the number of men that actually are needed to make it effective for war.

There is no desire on the part of any except extremists to change this principle by bringing the army up to a war strength in time of peace. The peace strength as maintained at present is too low, and army authorities want a larger standing army; but they do not propose that the principle

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of peace strength shall be altered. Financial considerations alone would dictate adherence to this rule.

This idea of a "peace strength" that is inferior to war strength is not a merely American measure. It is the same system that is fundamental during time of peace with even the most military of European nations. In all of them the standing army is small compared with the size of the armies that are to be raised when needed.

But the weakness of the American system is that while the United States has the same peace strength principle as in Europe, it utterly lacks the first approach to a system by which it can surely raise the army to war strength. The foreign nations really have that war strength available and ready. They carry its members on their rolls. America carries its war strength wholly in imagination. Europe knows where to put its finger on every man whom it shall want. America trusts to luck, although the Wars of the Revolu-

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tion, of 1812, the Mexican War, the Civil War and later the Spanish War have taught in unbroken, stern sequence that there is no such "luck."

Europe has the war strength as surely as if every man of that strength were under arms. The thousands and hundreds of thousands of men who are already trained and always ready are not in uniform, and are earning their livelihood in peaceful pursuits when there is no war. But they are an army as definitely as if they stood always in line. They are an army because they are "in reserve." The nation does not have to depend on them to "feel like" volunteering. When the need comes, they must serve.

For a long time the American nation, and particularly its Congress, had the devout belief that there would be absolutely no difficulty about raising its armies to war strength. There was a beautiful, inspired vision before everybody's mental eyes of millions of brave Americans rush-

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ing to arms and becoming victorious soldiers instantly through sheer force of patriotism and courage.

The belief is being shattered now, although not so many years ago anybody who ventured to oppose it was quite likely to find himself assailed as a traducer of his country. The European war has taught by object lessons that courage without training is futile. It is possible now to state without previous argument that the American army cannot be brought to war strength within a safe period of time unless there is behind the existing army another army of men who, though they are in civilian life, have been trained by previous service and who are obliged by agreement to return to the active army when their country needs them.

This proposed system of army reserve is not in any sense compulsory military service of the kind that makes Europe a great array of mightily armed nations. Even in Europe the reserve system is

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merely connected with compulsory service, and is not necessarily a part of it.

Nothing in any reserve system proposed for the United States has in it anything that could even simulate the "militarism" of Europe. There is no suggestion that the reserve system shall include the general citizenship. It will be formed wholly by the men who enlist voluntarily with the regular army as they do now.

These men will form the war strength that shall stand in continual, ever-ready preparedness behind the "skeleton" standing army. They must respond when they are called. It will not be left to their discretion. But the "compulsion" is only the compulsion that lies on every man in every station of life to keep his agreement. Under a reserve system the regular army will depend wholly on voluntary enlistment as it does now. When a man enlists, he will understand that he must undertake the obligation to enter the reserve after a stated period with the colors. If

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he does not wish to do this, he need not enlist.

As a matter of fact, however, the advantages that are offered to every enlisted man in any sound reserve system are such that it will make service in the army far more attractive than it is now. Thus it will not only make the present peace strength a sound thing, but it will encourage recruiting up to the limit of that peace strength.

To understand how unsound the peace strength principle is without its necessary complement of a trained reserve, it must be understood that the peace strength formation of the American army does not merely make the army as a whole short so many thousand men in the gross. The peace strength shortage permeates all the army formations. There is not a company, a battalion, a regiment or a brigade that could be put into the field at any time with a full quota of men.

For example may be taken the company,

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which is the smallest administrative army unit. It is the basic formation. All others, even the army corps, are built up from it. The principle of its creation is to form the most effective body that can be successfully commanded by not more than three commissioned officers.

The teaching of military experience is that the most favorable numerical arrangement for the company is 150 men commanded by 1 captain and 2 lieutenants with the necessary sergeants and corporals.

Under peace strength, the infantry company in the United States Army contains 65 men. Therefore, to build it up to its war strength 85 men should have to be put into it. It will be obvious to every reader that if those 85 men are untrained, the 65 men will be overwhelmed. They will not only be unable to stiffen and support the raw recruits with their own skill and knowledge, but their own value absolutely will be destroyed. The company of

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65 trained men will become a mob of 150 men who cannot pull together under any possible circumstances.

Therein lies the great danger of peace strength to the American army. If that peace strength is to be increased to war strength by systemless, haphazard volunteering, the confusion and demoralization thus entailed on all the basic units of the army will be like poison injected into a main artery.

XXVIII

WHAT THE PRESENT ARMY NEEDS IN OFFICERS, GUNS AND OTHER AUXILIARIES

THE newspapers of the country have presented so efficiently and fully the regular army's deficiency in men, that a mere summing up will be sufficient for the purposes of these articles, which have aimed more at explaining the underlying principles that make improvement necessary.

There is a subject that should be touched on before summing up. It is the deficiency in officers. This has been overlooked somewhat in view of the more startling disclosures of the shocking weakness in enlisted personnel.

One of the striking lessons of the war

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in Europe is that the loss in officers is appalling, and that the casualties in some instances have been so disastrous that certain anticipated operations of supreme importance have been not merely hampered but prevented because there were not enough men left to command the troops.

In 1912, two years before the present war, the General Staff of the American Army in a most comprehensive report on "The Organization of the Land Forces of the United States" said: "In modern military operations the loss of officers is fully as great as the loss of enlisted men. Further, under our system it will become necessary to detach officers from the regular establishment for staff duty and for employment with the citizen soldiery. The successful maintenance of large companies requires the presence of the full quota of officers and the whole machine breaks down if suitable men are not forthcoming. The lack of some provision (for

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reserve officers) is one of the greatest defects in our military system."

And again, in a report on "The Military Policy of the United States," it was said: "We shall require many thousands of officers in addition to those of the regular establishment as officers of volunteers and reserves in case of war, and steps should be taken to provide them in time of peace. The great losses in the early periods of all our wars caused from sickness, lack of sanitary precautions, faulty tactics, etc., are chargeable directly to the inexperienced officers placed in command. It is of vital importance to every mother and father of a young man as well as to the nation, to provide means for remedying such a state of affairs before it is too late."

This is not a matter on which the parties differ. The 1912 report was published under Mr. Taft's administration with the name of Mr. Stimson signed as Secretary of War. The report on the Military Policy was sent out in Mr. Wilson's administra-

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tion under Mr. Garrison as Secretary of War.

The remedy for the deficiency in officers is the same as for the deficiency in enlisted men. It is to form a reserve. The method is different. One proposal is to grant commissions in the reserve to militia officers who qualify and to graduates from military academies who will serve for a year with the regular army. Many other ways have been proposed. The service that the public can do is to back up the principle of forming such a reserve and let its experts select the best method.

ENLISTED MEN.—The army as it stands at present, without considering any of the foundational reforms that have been discussed in preceding articles, needs immediately at least 25,000 men. This is Mr. Garrison's recommendation to Congress for the mobile army. It may be accepted safely as the minimum. Mr. Garrison's now famous report of November 15, 1914,

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stated the needs of the army bluntly and plainly, but remained absolutely temperate and calm. It may be added that this demand for 25,000 men was intended only to meet the demands of a dangerous and, indeed, intolerable condition. It will not enlarge the army sufficiently to make it a formidable force. It will leave all the questions of organization, army posts, militia and reserves as pressing matters that must have the earnest and prompt attention of Congress.

ARTILLERY.—Trained observers in America knew before war was declared in Europe that the next war would be a war of artillery on a huge scale. No prescience was required. The Russo-Japanese War had established the fact. But perhaps not even the prepared Nations of Europe realized or guessed how vastly artillery would predominate. The matter of rifles has almost dropped out of mind in the face of the struggle to push more

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artillery and still more to the scenes of action.

"We have nothing like sufficient artillery and artillery ammunition," declared Secretary Garrison's report.

Even counting all the field guns that have been authorized but not yet built, the country is 208 guns short of the estimates made by its experts as to the minimum needs of the regular and volunteer army. This estimate was based on a lesser number of guns to the thousand infantry than the European belligerents are using now. Discounting the sensational reports that come from the battle fields of "thousands of field guns," it still is evident that the 1,056 guns that the United States will have when all have been completed, will be a small artillery line as compared with that of other modern armies.

Furthermore, this American field artillery includes few guns larger than the 3.8 inch field howitzers. Of the huge field artillery the American army has practically

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none. Its siege gun equipment is largely on paper.

AEROPLANES.—On July 18, 1914, Congress authorized the addition to the Signal Corps of an aviation section not to exceed 60 officers and 260 enlisted men. The army has adopted, and has stood by, the biplane tractor type of machine. The tractor is a puller—that is, its propelling power is in front instead of pushing from behind. The Signal Corps declares that its machines are the best known for military purposes. But they are very few in number, as may be seen from the small number of men authorized for the aviation corps. Estimates as to the number of flying machines in the belligerent armies vary so wildly that they can serve no sound purpose here for comparison. The deficiency of our army in this new and imperatively needed war appliance may best be illustrated by the fact that little Servia had 60 aeroplanes when the war began.

XXIX

CITIZEN SOLDIERY—THE NATION'S ONLY SOURCE FOR A BIG WAR ARMY

THE regular army is the only force that is distinctly ruled by the Nation, as expressed in the National Government. The only other armed force in the country, the organized militia or National Guard, is subject to National orders only under strict laws; and National control is qualified further by powerful considerations of policy.

A third potential force is that of the unorganized volunteers, to be drawn from the whole country irrespective of State lines and to enter the direct service of the Nation as a whole.

This is the body from which the big-

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gest army should have to come in time of stress. It exists only in the nebulous realm of theory. It is certain, of course, that American citizens would volunteer freely and generously in time of danger; but not a single man of this army-to-be is enrolled anywhere. No human being can guess how many men would offer themselves, where, when or how they would appear for enlistment or what their physical fitness would be.

The only thing that is certain is that they will be utterly untrained. Therefore the only citizen body that can be reckoned as available for an emergency is the organized militia.

This is a State soldiery. The ancient quarrel between States' Rights and National Power that once was so heated an issue, still dominates the conditions under which the Federal Government may call the militia into active service.

It is a fundamental matter that cannot be altered by legislation. The Constitu-

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tion of the United States has set rigid bounds to National control of the State militia, in the clause providing that "Congress shall have the power for calling out the militia" for only three purposes: (1) "to execute the laws of the United States," (2) "to suppress insurrection," (3) "and repel invasion."

Thus the organized militia cannot be called to operate one inch beyond a United States frontier. In 1903 Congress tried to beat the devil around the bush by giving the President authority to call out the militia for service "either within or without the United States," but in 1912 Attorney General Wickersham advised the Administration that the law was unconstitutional. He suggested that the term "to repel invasion" might have elasticity enough to permit the use of militia for crossing an American border if an enemy were assembled just beyond with clear intent to pass that border, or if in repelling invasion it should be advisable to

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pursue and capture a retreating invader beyond the frontier. His phraseology, however, intimated that even this was a tentative suggestion for stretching the meaning of the clause.

Assuredly the organized militia could not be sent into Mexico. It could not be sent to Panama or the insular possessions. The only way to make the militia available for such service is to ask (not order) organized militia regiments to volunteer as a body for enlistment in the United States Army. This is what was done in the Spanish War, when militia was wanted for Cuba and the Philippines.

To accomplish it, the Government had to accept the militia units with their own officers and to appoint those officers temporarily to corresponding grades in the National Army. The result was excellent where the officers were good. Where they were not good, the results were very bad indeed.

This fact illustrates the weakness of

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the organized militia system in its capacity as an indispensable factor in American defense. The weakness is not that the militia wants its own officers to command it in war as in peace. That simply is a graphic symptom of the weakness.

The weakness is that the Nation maintains a regular military army in quite insufficient numbers because it expects to fortify it with militia, and yet this indispensable militia is not amenable to any direct National control. Even if the militia were perfect, it is obvious that in time of emergency there must always arise vast difficulties in trying to combine one machine (the regular army) which has been constructed and managed by one government (the Nation), with 49 other machines that have been constructed separately and managed separately by 49 governments.

In actuality the difficulty will be increased overwhelmingly because the militia is not nearly perfect. Perhaps the

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most striking characteristic of the organized militia considered as a whole is the enormous difference in quality between the organizations of the various States and even the difference between organizations within the same State.

Some States have regiments almost as well trained as are regulars. Other States have so neglected or mismanaged their citizen soldiery that practically the entire National Guard of such States is wholly unfit.

The same difference exists among the militia officers. There are many who have become accomplished soldiers. They have spent their time and their money generously for no reward except that of serving their country, and they have undertaken work so arduous that most citizens would shrink from it. It is so, also, with the enlisted men. Where unmilitary citizens devote their spare time to their own pleasure, thousands of National Guardsmen cheerfully work year after

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year in their armories and give up their scanty vacation time to field drills or maneuvers. These men, many of them humble citizens, deserve every honor that the Nation can pay them.

The calamitous phase of this situation is that these men who have qualified themselves for war, will have to pay in blood and life for the weakness of the inefficient organizations. When the latter break, it is the trained men who must try to save the day by a desperate stand. And no State, however wise and efficient, can force another State to reform its militia. The National Government cannot do it.

That is the crass weakness in the American system of depending for war service on a mixed body, partly regular soldiers bound to unquestioning obedience to the Nation and partly citizen soldiers bound to obedience only to their States. It might be a sound system, if it could be administered soundly.

Many efforts have been made to "get

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around" the Constitutional provision that forbids Federal control. One Congress Act has provided for Federal assistance to the States with cash and equipment. This costs heavily, and much of the money and supplies are wasted by careless States, but it enables the War Department to prescribe conditions of efficiency if a State wants to participate. Under this plan the regular army authorities have managed to institute many valuable reforms.

The most encouraging development, however, is a change in sentiment toward regular army aid and instruction. It was brought about largely by the system of assigning regular army officers to instruct State militia on request of the Governors. They were received at first with coldness and often with active antagonism, but they have broken down opposition by demonstrating their ability. To-day it can be said truthfully that the National Guard as a whole welcomes instruction from the United States Army, and an

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annually increasing number of commissioned and non-commissioned officers has to be detailed for the work.

The proposal most prominently before the Nation now is to give the State militia a certain amount of Federal pay, in return for which the militiamen must agree to enter the service of the Nation in time of need. This, it will be seen, is another attempt to get around the Constitution, but it does so in a legitimate manner, since it does not try to stretch the Constitution but proposes only a voluntary contract between the Nation and the citizen soldiers as citizens.

XXX

WHAT IS WRONG WITH THE NATIONAL GUARD?

THOSE who dismiss the National Guard with a few contemptuous words perform as poor a service to their country as do those who proclaim oratorically that the militia is prepared to fight a victorious battle any moment.

The very fact that there is a National Guard proves the faithfulness and patriotism of plain American citizens. The fact that it has improved measurably in quality during the past decade indicates that further improvement is possible. Such improvement would be certain if every taint of State politics and private politics could be removed from the organization, and a

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legitimate but thorough and fairly mandatory Federal control could be established. Such Federal control would give the entire organized militia of the country one uniform system of education, drill and equipment. It would organize the militia into army divisions, not necessarily limited to State lines.

To-day the National Guard decidedly is not fit for war. It may be doubted if it could be rendered fit in six months.

The defects existing at present in the organization as summarized here are taken largely from the official statements of an army officer whose whole attitude when he made his reports was friendly to the militia. Therefore his criticisms, even when strong, may be accepted as being forced only by undeniable facts. This officer is Brigadier-General A. L. Mills of the General Staff of the United States Army, whose last report was made in his capacity as Chief of Militia Affairs.

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NUMBERS.—More than 60 per cent. of the infantry and engineer companies, 70 per cent. of the cavalry troops, 80 per cent. of the coast artillery companies, and practically all of the field artillery batteries are below the lowest minimum number of men prescribed for such organizations. In no State in the Union is the prescribed minimum peace strength of all organizations maintained. In many instances the companies are such in name only and utterly worthless to the Nation as a military asset.

DIVISIONAL ORGANIZATION.—Only two States are so far advanced that their National Guard may be expected to become a properly organized army group in the near future. All the other States are deficient in auxiliary troops for their infantry, even where their infantry itself is grossly inadequate in size.

RIFLE PRACTICE.—Records of eight years show that only about two-thirds of

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the militia throughout the country have availed themselves of opportunity for rifle practice. This is the average. Many States fell far below it. The records of some of these low States in 1913 were: percentage of strength firing rifle, 3.33, 19.40, 21.97 and 23.50 per cent.

Stated in numbers, the record is more graphic. Out of a total of 111,140 men and officers supposed to pursue the prescribed course of rifle practice, only 66,974 actually fired on the range, and a great part of this number did not pursue the course, but had merely more or less practice. Only 42,599 qualified as second-class marksmen or better. No infantryman can be regarded as fit for battle purposes unless he is at least a second-class marksman. Therefore this record means that only 38.3 per cent. of the militia infantry of the United States were suitable last year to take the firing line.

In this connection it may be suggested that the public must not be deceived by the

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remarkable shooting done by militiamen at the various competitions and matches. These are picked shots. They are to be counted by dozens as against thousands who cannot shoot at all.

CAVALRY.—Many militia organizations have bought their own mounts and maintain them at their own expense because their States will not aid them. The States as a rule discourage cavalry because it is more expensive than infantry. One State owns only 5 horses. Two others own 7 each. Twenty cavalry organizations have neither riding halls nor stables. Seven others have riding halls but no stables, and six have stables but no riding halls.

Eight States have only 1 troop of cavalry each. There are only five cities that have cavalry in excess of 100 men. Fifty-five troops occupy one-troop stations, which means that they cannot expect to have squadron drill—and the squadron is

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the smallest combatant unit. Men who have not been trained to ride in squadron would, very possibly, cause more disaster to their own side in a charge than the enemy might cause.

FIELD ARTILLERY.—Only one State has supplied its infantry with a full quota of protective field artillery. Five States have each 66 per cent. of the required number of batteries (in men). Eight States have 50 per cent. each. Fourteen States have 42 per cent. each. Five States have only 25 per cent., and four States have 17 per cent.

Twenty-eight artillery organizations are entirely unprovided with facilities for mounted instruction. This means that they can practice with their guns in the armory, but that they never get a chance to learn how to take them into action except perhaps at an annual encampment. Twenty-four organizations reported that they had held no mounted drills during

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the entire year. Eighteen drill halls were reported as not being adequate even for the instruction of the battery dismounted, and 34 halls were not provided with facilities for sub-caliber practice.

Forty-one artillery bodies out of 67 had no artillery target practice during a whole year. These facts lend decidedly menacing point to General Mills' remark that "the States which send their infantry into active service without having made every possible effort to supply it with an adequate field artillery support, will see in the needless sacrifice of that infantry the cost of their short-sightedness."

It must be remembered that the Regular Army, short in everything, is short in nothing so much as in field artillery. Therefore the State militia, if it goes into battle, can get no help from the regulars, but must go in naked, perhaps to be blown to fragments by an enemy who drops shell on it from a distance so great that he is miles beyond their reach.

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SANITARY TROOPS.—Only two States have a full quota of field hospitals and ambulance companies. Seventeen States have no ambulance companies at all. West of the Mississippi River there were only 7 field hospitals and 2 ambulance companies in the year ending June, 1914. Many organizations were reported in that year as being without proper medical material, and as lacking even their complement of service shoes and overcoats. The entire organized militia, if called out at once, would go to battle lacking 269 ambulances of the minimum number that it is certain they would need desperately.

COAST ARTILLERY.—This part of the National Guard is short 11,000 men of the minimum force needed to man one-half the gun defenses in the United States. The War Department has reported that training has been unsatisfactory because of small and irregular attendance making it "impossible to organize and train per-

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manent gun and fire-control sections," while "adequate armory instruction and team work is almost out of the question." It is only just to say that the efficient organizations in this branch of the service have made records as excellent as the inefficient ones are poor. Thus, of the 450 coast artillery militia officers, 290 hold War Department certificates of proficiency in one or more coast artillery courses, while almost 1,400 enlisted men qualified for various duties of high class. But the organizations, as organizations, are not qualified to take their places in American harbor defenses and serve their guns immediately against an enemy. They would need organization and drill. Therefore the War Department is well within the truth when it reports to Congress that "in this respect the coast artillery militia fails to meet expectations."

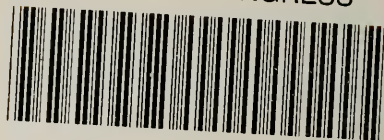
There remains to be added only the fact that despite the fact that the Federal cash

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contribution to the States for militia support amounted to \$4,815,000 during the fiscal year 1914, "only 11 States had on hand at the time of the last annual inspection one complete uniform (less shoes) for each enlisted man of the authorized minimum strength."

THE END

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